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Thorough Research

ADDRESS CORRECTION REQUESTED

FROM

**SCIENTIFIC PROTOTYPE MFG. CORP.**

615 West 131st Street

New York, N. Y. 10027

TO:

T. NELSON

BOX 1546

POUGHKEEPSIE, NY 12603

RETURN REQUESTED

GRAYARC CO., BKLYN., N.Y. 11232

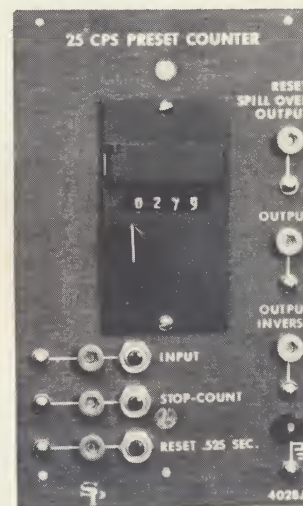
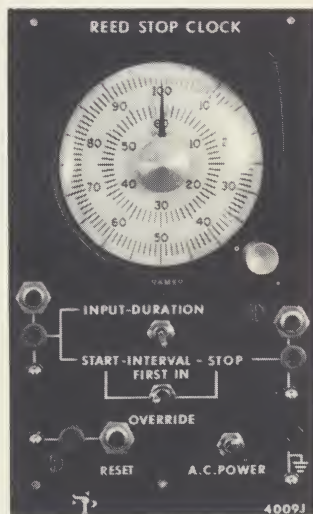
ADDRESS CORRECTION REQUESTED

CATALOG



## SHORT FORM CATALOG NO.3

## Reed Relay Equipment for Programming and Control



The Scientific Prototype Reed Relay System of programming control equipment represents a new approach which is fully compatible with and functionally equivalent to conventional 24 VDC equipment. The new system provides higher operating speed, lower noise, longer life, simpler interconnection, greater flexibility and improved reliability at a competitive price. Input and output isolation, separate input and output spark suppression and a host of internal refinements provide a new high in convenience and utility.

The individual units summarized on the following pages are designed to clip mount on standard  $6\frac{1}{2}$ " 24 to 28 VDC power rods. Each unit requires  $\frac{1}{8}$ ,  $\frac{1}{4}$  or  $\frac{1}{2}$  the space provided on a single pair of bars. This system *must* be operated with the positive power supply lead attached to the top power rod of each pair. A "lock-out" on each unit will prevent operation if the polarity is reversed. Power supply voltage must be held to 24 to 28 VDC including ripple and transients. A momentary drop below 22 VDC may cause spurious "drop-out." A momentary excursion above 30 VDC may cause damage to semiconductors and will void the warranty. Scientific Prototype reed relay power supplies are well regulated and provide current limiting plus overload "lock-out" for double short circuit protection.

All inputs and outputs are in the conventional form of switch closures to ground (-24 VDC) ex-

cept special outputs such as shock, audio signals, etc. All outputs are rated at 3 amps except for the stepper decade and a 2-pole, 33-position stepper (which are Automatic Electric type 40 steppers rated at 300 milliamps interrupt, 1 amp carry), and the logic and cradle relays, binary relay and manual timer (rated at 5 amps). All solid state outputs are internally fused at 3 amps (make, break and carry, 24 to 28 VDC resistive or inductive). Inputs draw low current (30 to 100 milliamps typically) and are buffered by reed relays or transistors.

Two types of inputs are used: "A.C." (pulse coupled) and "D.C." (direct coupled). An A.C. input responds to the onset or establishment of an input; the continued presence of an input has no effect. A D.C. input responds to the presence of an input signal. The response continues for the entire duration of the input. Similarly, A.C. and D.C. outputs are used. A.C. outputs provide a pulse to signal the establishment of a particular condition. The continued presence of the condition does not produce any further output. A D.C. output signals the presence of a particular condition and continues as long as the condition persists.

There are two front panel connections for each input and output. One member of each pair is a conventional snap stud, to insure compatibility with existing relay equipment, the other is a color coded pin jack which accepts stackable patch cords. While snap leads may be used throughout the

(Continued on Back Page)



UNIT	TYPE	PRICE	DESCRIPTION
3 amp Regulated Power Supply 10 amp Regulated Power Supply	Cat. Pg. 1 4026-J 2 4027-J	\$125 Meters \$20 add'l. \$220 Meters \$20 add'l.	3 amp 1/4 rack (with meters 1/2 rack), 10 amp 5 1/4" rack panel. Output 26 VDC. Regulation $\pm 1\%$ line and load, ripple 10 mv. RMS. Transistor regulated, short circuit proof. Overcurrent limiter plus separate solid state circuit breaker with indicator lamp and manual reset.
Pulse Generator	3 4013-J	\$53	1/8 rack, single unit, reed relay. A.C. input with push button, A.C. output with pilot light. D.C. inverse output. Choice of two pulse widths - 10 or 30 msec.
Dual Pulse Generator	3.1 4069-J	\$56	1/8 rack, two identical units, reed relay. A.C. input with push button. A.C. output. Choice of two pulse widths, 10 or 30 msec.
Start/Stop Pulse Generator	4 4036-J	\$68	1/8 rack, single unit, reed relay. A.C. input with push button, A.C. output (start), separate A.C. output (stop). 10 or 30 msec. pulse widths. Provides separate start/end pulses.
Universal Pulse Generator	5 4053-J	\$127	1/8 rack, single unit, reed relay. Solid state outputs (4) for maximum life. A.C. input with push button, separate start/stop A.C. outputs. 10 or 30 msec. pulse widths. Separate D.C. start/stop inverse outputs.
Inhibit Pulse Generator	5.1 4064-J	\$61	1/8 rack, two identical units, reed relay. A.C. input, D.C. inhibit input. A.C. output. Fixed pulse width 30 msec. Output is "all or none."
Solid State OR Gate	6 SS 4044-J	\$81	1/8 rack, single unit. D.C. inputs (3 leg), D.C. output with pilot light, D.C. inverse output. Entirely solid state.
OR Gate	7 4002-J	\$43	Reed relay equivalent to SS-4044-J. Identical in function and appearance except for lower <sup>1</sup> maximum operating speed.
Dual OR Gate	8 4029-J	\$36	1/8 rack, two separate identical units, reed relay. No pilot light or inverse output. D.C. inputs (2 leg each gate). D.C. outputs.
Dual Exclusive OR Gate	9 4043-J	\$61	1/8 rack, two identical units, reed relay. D.C. inputs (2 leg), D.C. output with pilot light, D.C. inverse output. Output results from either input but <u>not</u> both. Simultaneous inputs do not produce an output.
Solid State AND Gate	10 SS 4047-J	\$83	1/8 rack single unit. D.C. inputs (3 leg), D.C. output with pilot light, D.C. inverse output. Entirely solid state.
AND Gate	11 4001-J	\$45	Reed relay equivalent to SS-4047-J. Identical in function and appearance except for lower maximum operating speed.
Dual AND Gate	12 4035-J	\$45	1/8 rack, two separate identical units, reed relay. No pilot light or inverse outputs. D.C. inputs (2 legs each gate), D.C. outputs.
Memory AND Gate	13 4017-J	\$45	1/8 rack, single unit, reed relay. D.C. inputs (2 leg), D.C. reset input (overriding) with push button, D.C. output with pilot light, D.C. inverse output. Both inputs required to produce output; continuation of either continues output, i.e., acts as memory. Reset erases memory.
Diodes	14 4011-J	\$29	1/8 rack, entirely passive. 8 identical separate diodes, 3-amp. maximum continuous current (each). 300 amp 8 msec. surge rating.
Dual Inverter	15 4033-J	\$36	1/8 rack, two separate identical units, reed relay. One D.C. input, one D.C. output each section. Input turns off output. No input gives output.
Flip-Flop Reset-set (latching relay)	16 4019-J	\$52	1/8 rack, single unit, reed relay. D.C. set, D.C. reset inputs with push buttons, selectable overlap dominance, D.C. output with pilot light, D.C. inverse output.
A.C. Flip-Flop R-S	16.1 4065-J	\$60	1/8 rack, single unit, reed relay, A.C. set, reset inputs with push buttons. D.C. output with pilot light, D.C. inverse output.

UNIT	TYPE	PRICE	DESCRIPTION
Noise Generator	Cat. Pg. 49 4025-J	\$141	1/4 rack, R.S. Flip-flop input, either duration or start/stop control (with switch selected overlap characteristics). D.C. inputs with push buttons. D.C. monitor output with pilot light. Output level and bandwidth controls (5, 10, 20 kc). Contains power amplifier to drive 3- to 16- ohm loudspeaker.
Audio Stimulator	50 4015-J	\$129	1/4 rack. Identical to 4025-J except generates tone instead of noise. Controls for level and repetition rate. Contains power amplifier to drive loudspeaker.
Click-Flash Generator	51 4041-J	\$165	1/4 rack. Identical to 4015-J except very low frequency (1-100 cps). Repetition rate and intensity control (click intensity only). Separate outputs. Flash drives NE-51-H lamp.
A.C. Power Control	52 4049-J	\$81	1/8 rack, D.C. reed relay input with push button. Output 115 VAC, 5 amp maximum (solid state intensity control), with pilot light. Solid state equivalent to variac.
Equipment Power Control	52.1 4067-J	\$57	1/4 rack AC power on/off control. Manual or D.C. input. 6 fused rear output sockets (3 wire AC power with ground). 5 amps max. — total load. Convenient equipment turn on/turn off control panel. Often used with session timer.
Cage Connection Panel	53 4040-J	\$105	1/2 rack. Convenience inputs for house light, 2 cue lights, buzzer, feeder, dipper, retractable lever, A.C. power, shock, loudspeaker and spares. 27 pin cage connector.
4-Channel Event Recorder	53.1 4070-J	\$238	1/4 rack, single unit. Pressure sensitive paper, no ink or hot stylus. 12" per hour standard chart speed; others available. 60 foot chart roll. Four D.C. inputs with push buttons, continuous duty coils. 20 cps max. AC motor switch with D.C. input to control (paper stop) relay. Access window and paper tear-off provided.
Diode Snap Lead	54 4054-J	\$2.00	8" or 24" snap lead with built-in 3-amp diode ("back path eliminator"). Other lengths available.
Diode Pin Lead	54 4055-J	\$3.50	8" or 24" stackable pin jack lead with built-in 3-amp diode ("back path eliminator"). Other lengths available.
Snap Lead	54 4056-J	\$ .40	8" or 24" snap lead. Other lengths available.
Pin Lead	54 4057-J	\$ .96	8" or 24" stackable pin jack lead. Other lengths available.
6½ inch Power Bars	55 4058-J	\$7.50	Standard equipment mounting power rods. Fit 19" rack. Snap fittings on rods. For 24 to 28 VDC.
2 inch Bi-filar Reed Coil	56 4059-J	\$5.00	Standard reed coil. For replacement use in most reed relay equipment.
1 inch Reed Coil For Std. Reed	56 4060-J	\$2.50	Special single coil. Occasionally used with two or three sub. min. reeds or single standard reed.
1 inch Reed Coil For Sub.Min. Reed	56 4061-J	\$2.50	Special single coil for single sub. min. reed.
2 inch Standard 3 amp Reed	57 4062-J	\$1.50	Standard wide-differential 3-amp plated reed switching capsule.
1 inch Sub. Min. 1/2 amp Reed	57 4063-J	\$1.50	Sub. min. wide differential 1/2-amp plated reed switching capsule.

Prices: Effective August 1, 1966 f.o.b. New York City.  
Subject to change without notice.

Terms: Net 30 days.  
Warranty: 1 year — see detailed catalog.

Detailed catalog available upon letterhead request.



(Continued from Page 1)

system, pin plugs provide a more durable and reliable interconnection system and the pin jacks themselves give visual indication of the function of the connection point.

The color code used throughout the system is as follows:

Jack Color	Connection
Light Green	A.C. Input
Dark Green	D.C. Input
Light Blue	A.C. Output
Dark Blue	D.C. Output
Black	Ground
Red	+24 VDC
Yellow	Floated Switch Arm
Brown	Normally closed contact of floating (isolated) switch
Orange	Normally open contact of floating switch

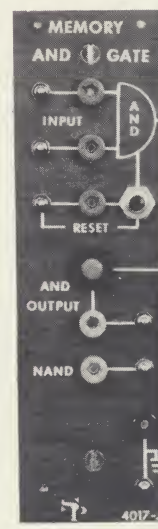
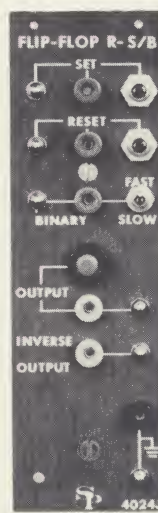
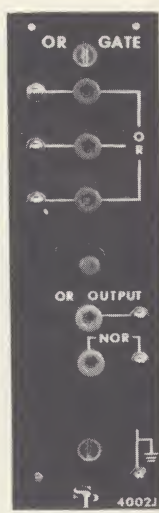
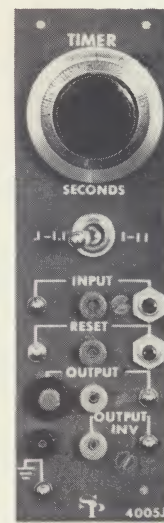
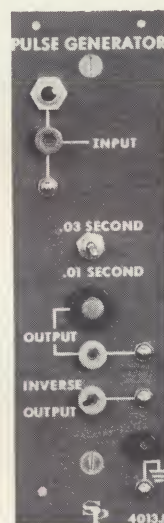
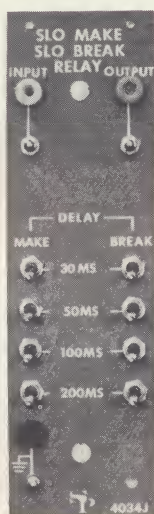
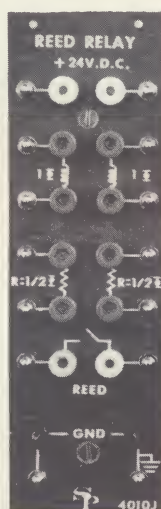
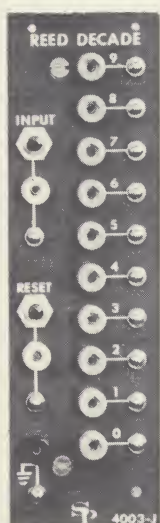
The last three are completely isolated and not spark suppressed. (This permits any type of signal to be switched with these contacts.)

Operating speeds for reed relay units are conservatively given at 100 cps and 1000 cps for solid state units unless deliberately limited by filters as in a slo-make, slo-break relay, bounce filter, delay generator, etc. Units containing standard electro-mechanical devices such as Sodeco counters are limited by the operating characteristics of these devices.

Pilot lamps are long-life, low-cost units with high operating speed. All lamps except for numerical display units are replaceable from the front panel. Numerical displays use easily replaceable 50,000 hour lamps.

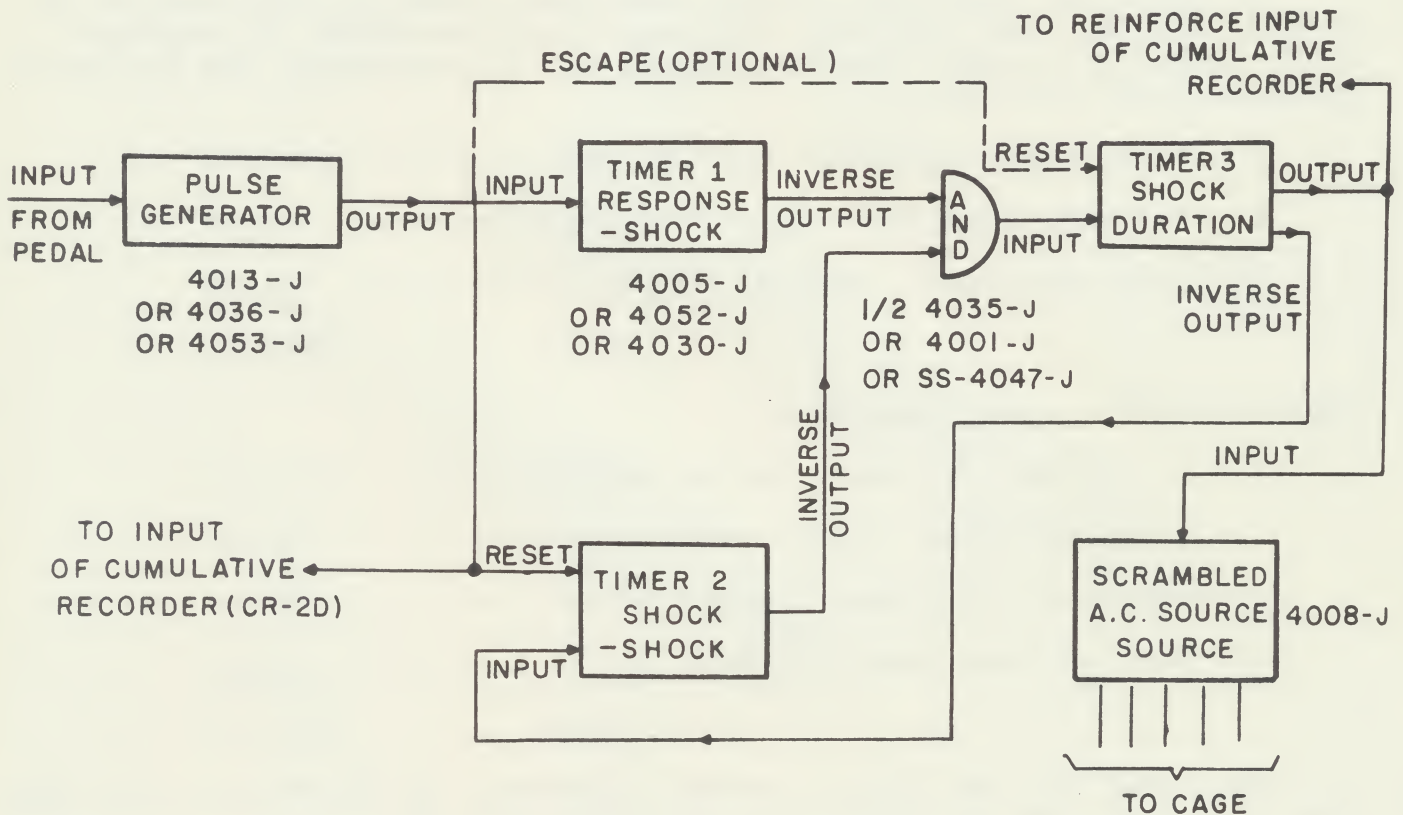
Reed relays provide form-A contact behavior (SPST — N.O.) while the logic and cradle relays have four form-C contacts (DPDT — break before make).

The staff of Scientific Prototype would like to take this opportunity to offer all possible applications assistance to users of S.P. reed relay equipment. As always, there is no charge for systems engineering or applications assistance.





## SIDMAN AVOIDANCE SCHEDULE WITH SEPARATE R-S AND S-S TIMES AND OPTIONAL ESCAPE



The equipment diagram shown above represents a standard Sidman Avoidance Schedule with the response-shock interval controlled by Timer 1, and the shock-shock interval controlled by Timer 2. Shock duration is controlled by Timer 3. The dotted connection allows the addition of an escape condition.

The equipment operates in the following manner: Timers 2 and 3 alternate indefinitely. Timer 3 drives a scrambled shock source, thus providing shock duration; Timer 2 provides a shock-shock interval. An animal response resets (stops) the shock-shock timer and starts Timer 1, the response-shock timer. This timer will accept new inputs while timing, which will result in an extension of the timing interval by the full set amount. Therefore, if the animal responds often enough, Timer 1 will never complete its cycle.



The inverse outputs of Timers 1 and 2 are connected to the input of Timer 3 through an AND Gate. Therefore, Timer 3 is started only when both Timers 1 and 2 turn off, which occurs either at the end of the shock-shock interval if the animal has not responded, or at the end of the response-shock interval if the animal has responded at least once. If the escape line is added, a response during shock will terminate the shock. Timer 1 will, of course, be started again, as before.

All three intervals may be selected within the range of .01 to 110 seconds, depending on the Timer selected and the ranges chosen.

If the first unit type listed under each block in the diagram is ordered and the time intervals used are: response-shock, 10 seconds; shock-shock, 5 seconds; shock duration, 300 milliseconds, the following equipment list results:

3 - Reed Timers (4005-J)	\$147.00 each	-----	\$441.00
1 - Dual AND Gate (4035-J)		-----	45.00
1 - Pulse Generator (4013-J)		-----	<u>53.00</u>
	Total		\$539.00

Appropriate Auxiliary Equipment:

1 - Scrambled A.C. Shock Source (4008-J)	-----	\$260.00
1 - Regulated Power Supply (4026-J)	-----	125.00
1 - Cumulative Recorder (CR-2D)	-----	327.00
2 - Sets of Power Rods (4058-J)	\$7.50 each ----	<u>15.00</u>
	Total	\$727.00

The total for the entire system, therefore, is \$1,266.00, plus the cost of a cage and any additional equipment desired.

If the response-shock and shock-shock intervals are the same, one Timer may be deleted and a second pulse generator added with a substantial reduction in cost.

This is just one of many examples of the use of Reed Relay control equipment. The entire system requires two sets of power rods. The equipment is fast, ultra-reliable, almost silent, and still competitive in cost to conventional relay equipment because of the unusual flexibility of the individual units.



615 W. 131 STREET, NEW YORK, N.Y. 10027

SUPPLEMENTARY REED RELAY PRICE LIST  
EFFECTIVE 9/15/66

<u>Cat. No.</u>	<u>Description</u>	<u>Unit Price</u>
		\$
4073-J	3-Pole, 11-Position Stepper	165.00
4074-J	3-Pole, 20-Position Stepper	185.00
4075-J	Hi-Speed Binary Relay	84.00
4076-J	Stop Pulse Generator	55.00
4077-J	Dual Stop Pulse Generator	63.00
4078-J	Dual DPDT Relay	28.00
4079-J	Dual 4PDT Cradle Relay	55.00
4080-J	Decade Reed Switch	83.00
4081-J	Hi-Speed DPDT Relay	48.00
4082-J	Bi-Directional Stepper	235.00
4083-J	Non-Synch. Probability Generator	278.00
4084-J	Print Counter	535.00
4085-J	Decade Memory Switch	185.00
4086-J	3-Pole, 33-Position Stepper	225.00
4087-J	Universal Pulse Standardizer	161.00
4088-J	Bi-Directional Punched Tape Reader & Control	1145.00
4089-J	Print Counter (Variable Format)	765.00
4090-J	Bi-Directional Tape Punch & Control	1425.00
-----		
4013-JA	Pulse Generator; identical to 4013-J except start/end switch added to allow start or stop pulse operation	60.00
4005-JA	Timer; identical to 4005-J with time completed pulse output added	160.00
	110 sec.	190.00





## **EQUIPMENT CATALOG**

**SCIENTIFIC PROTOTYPE MFG. CORP.**

**615 WEST 131st. STREET NEW YORK, N.Y. 10027**



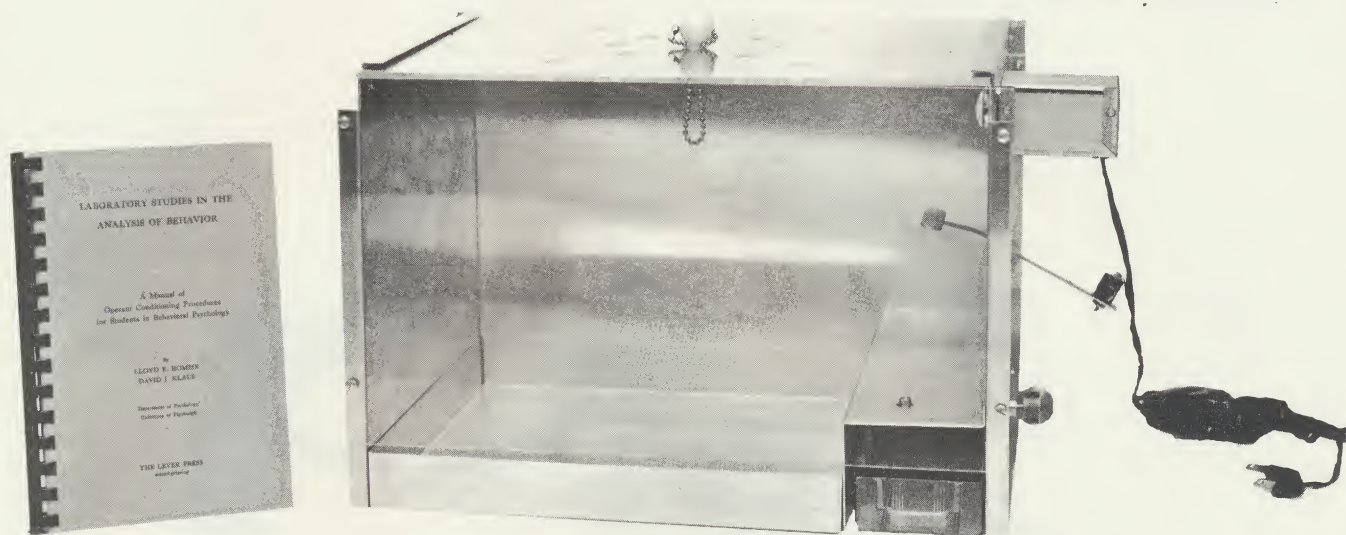
SCIENTIFIC PROTOTYPE  
GENERAL EQUIPMENT

9/1/66





## OPERANT CONDITIONING KIT MODEL 25



The unit pictured above is a low priced rodent test cage kit for basic operant conditioning. It is designed for use in first year behavioral psychology laboratories and can easily be assembled by students.

The overall dimensions are 11"H x 11"W x 15"D. Three vertical sides are made of aluminum (for durability) and one side of Lucite (for excellent visibility to permit student observation). The sliding top (for animal entry) is also made of plastic, with holes (for ventilation). An aluminum droppings pan is provided.

Reward is given as liquid reinforcement by means of a manually operated, liquid dipper made of brass and bronze. The small dipper is filled from a sliding, plastic tray.

The animal manipulandum is a manual pedal lever (without micro-switch). For conditioning, a fully enclosed cue light, with a 7 Watt bulb, is mounted above the pedal.

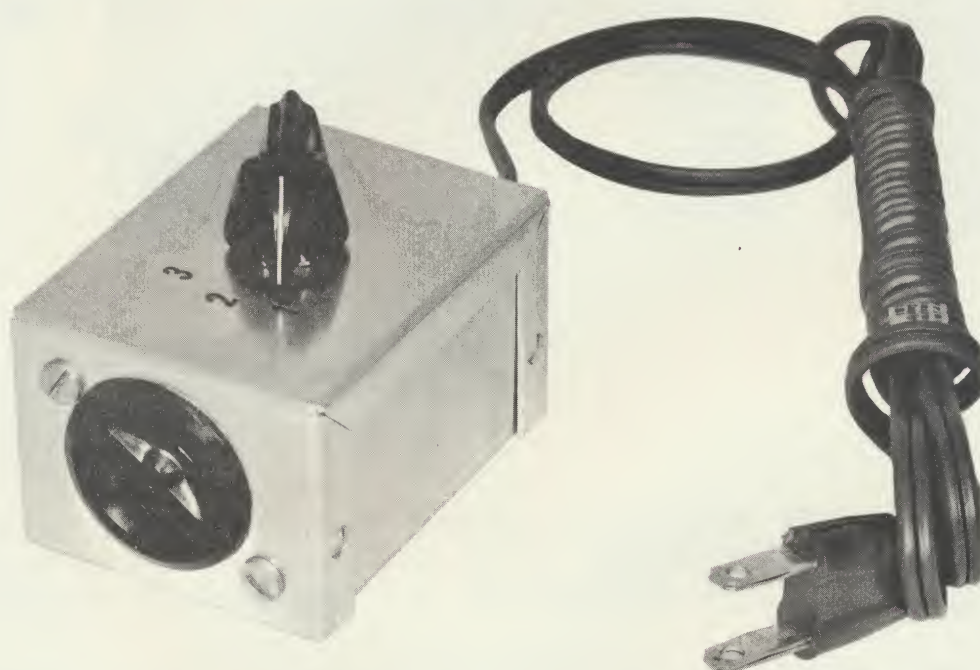
Included with the unit are assembly instructions and a manual for studies in operant conditioning which can be performed with this kit. These studies include: acquisition, extinction and

(over)

spontaneous recovery, as well as secondary reinforcement, stimulus discrimination, stimulus generalization, and a number of variations of the above. (For instance: for chaining of responses, a beaded loop is provided which is mounted from the top of the test cage.)

Optional: A light intensity control box for discrimination and generalization studies.

Shipping weight is approximately 12 lbs.



Light Intensity Control Box



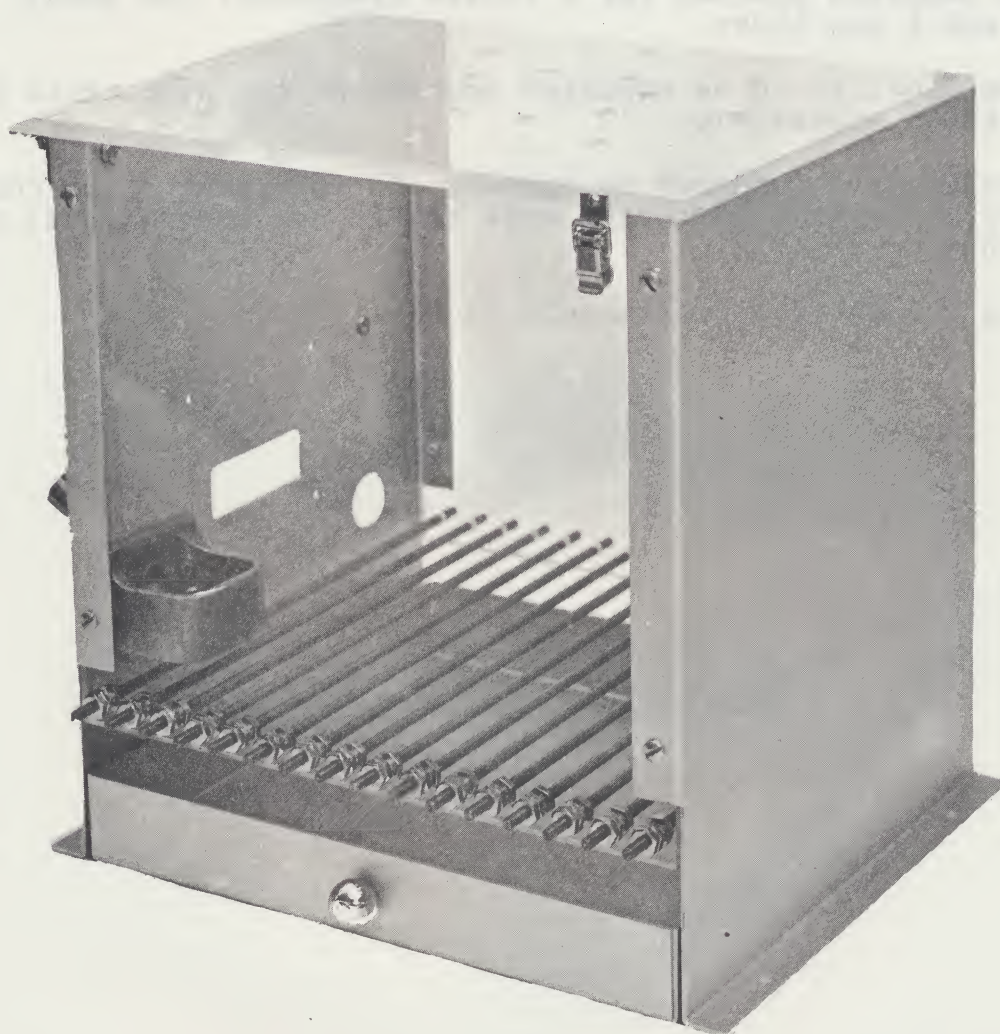
SCIENTIFIC PROTOTYPE MFG. CORP.



PHONE: AREA CODE 212  
368-6000

615 W. 131 STREET, NEW YORK, N.Y. 10027

RODENT TEST CAGE MODEL A-100



This A-100 is the basic rodent test cage on which all standard SCIENTIFIC PROTOTYPE rodent cages are based. Two clear Lucite side walls; a hinged, ventilated Lucite top (with a retaining latch); and two iridized aluminum side walls form the basic structure. The floor is formed of sixteen (16) stainless steel bars ( $\frac{5}{32}$ " in diameter, located  $\frac{9}{16}$ " on center) insulated for shock application. The internal dimensions (above the grid floor) are  $7 \frac{9}{16}$ "H x  $9 \frac{1}{4}$ "W x 8"D. The exterior dimensions are  $10 \frac{1}{4}$ "H x  $9 \frac{7}{16}$ "W x  $8 \frac{5}{8}$ "D. An iridized aluminum droppings pan is included.

The standard A-100 cage is supplied with one blank wall and one wall with a food tray and water bottle clamp installed (water bottle not provided), plus a cutout for mounting a standard or retractable pedal lever. This is the type 51 end panel and will be supplied unless otherwise specified.

If a different end panel is required, it must be specified by adding the panel code to the cage number. For example, A-100 (50) will be supplied with both end walls blank. An A-100(54) will be supplied punched for a liquid dispenser, one pedal lever, and a cue light.

If a cue light is to be supplied mounted on the cage, this must be specified separately.

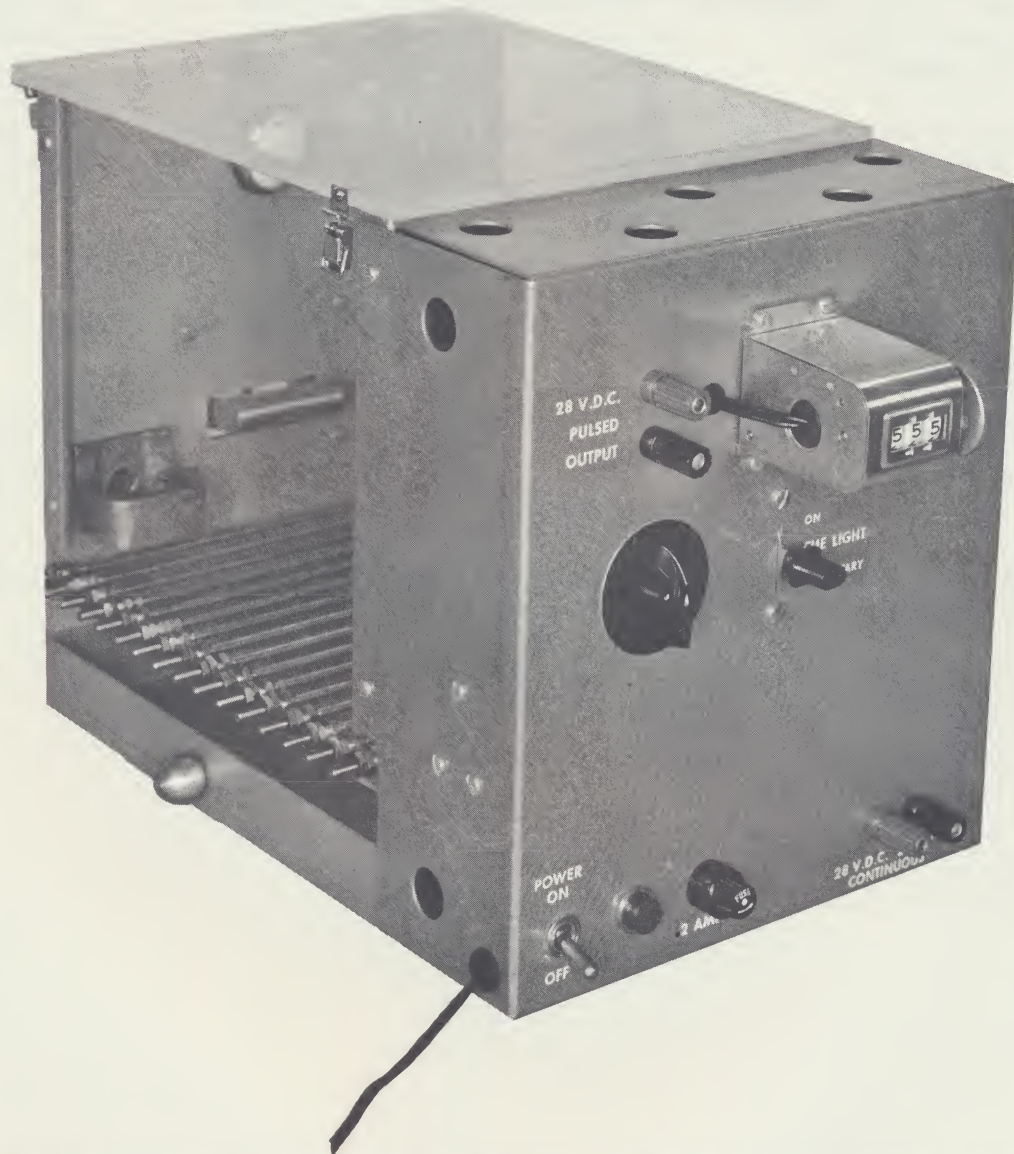
End panels may be ordered separately and interchanged to convert any SCIENTIFIC PROTOTYPE cage to fit new experimental requirements.

Shipping weight is approximately 14 lbs.





RODENT TEST CAGE MODEL A-101A



The A-101A rodent test cage consists of the basic cage plus a self-contained piggy-back control unit.

The internal dimensions (above the grid floor) are 7 9/16"H x 9 1/4"W x 8"D. The overall dimensions are 10 1/4"H x 12 1/2"W x 8 5/8"D. The sixteen (16) stainless steel grid bars forming the floor are 5/32" in diameter, located 9/16" on center and insulated for shock application. An iridized aluminum droppings pan is provided. Included are a food tray, water bottle, cue light, and pedal lever.

The cage has two Lucite side panels and a hinged, ventilated Lucite top (with a retaining latch). Two iridized aluminum end panels and a grid bar floor complete the assembly. A standard food tray is provided for use with a pellet dispenser (series D-700, available for three pellet sizes and five ratios). If liquid reinforcement will be employed, please specify. The water bottle and food tray will be deleted and the end panel punched for a liquid dipper unless the punch-out for the solenoid valve liquid dispenser is specifically requested.

The piggy-back control unit contains a 2-amp, 28 VDC power supply; a 3-digit, manually reset, response counter, permanently wired to the pedal lever; and a silent, center-off cue light switch wired to the cue light, which is spring loaded in one direction, for manually controlled short stimulus durations, and self-holding in the other direction, for longer stimulus durations. Cue light intensity is adjustable for three brightness levels.

Additional provisions are: an auxilliary output from the pedal lever and a pair of power supply output terminals (28 VDC, 2-amps total) to operate external equipment. An A.C. power switch, fuse, and pilot light are also provided.

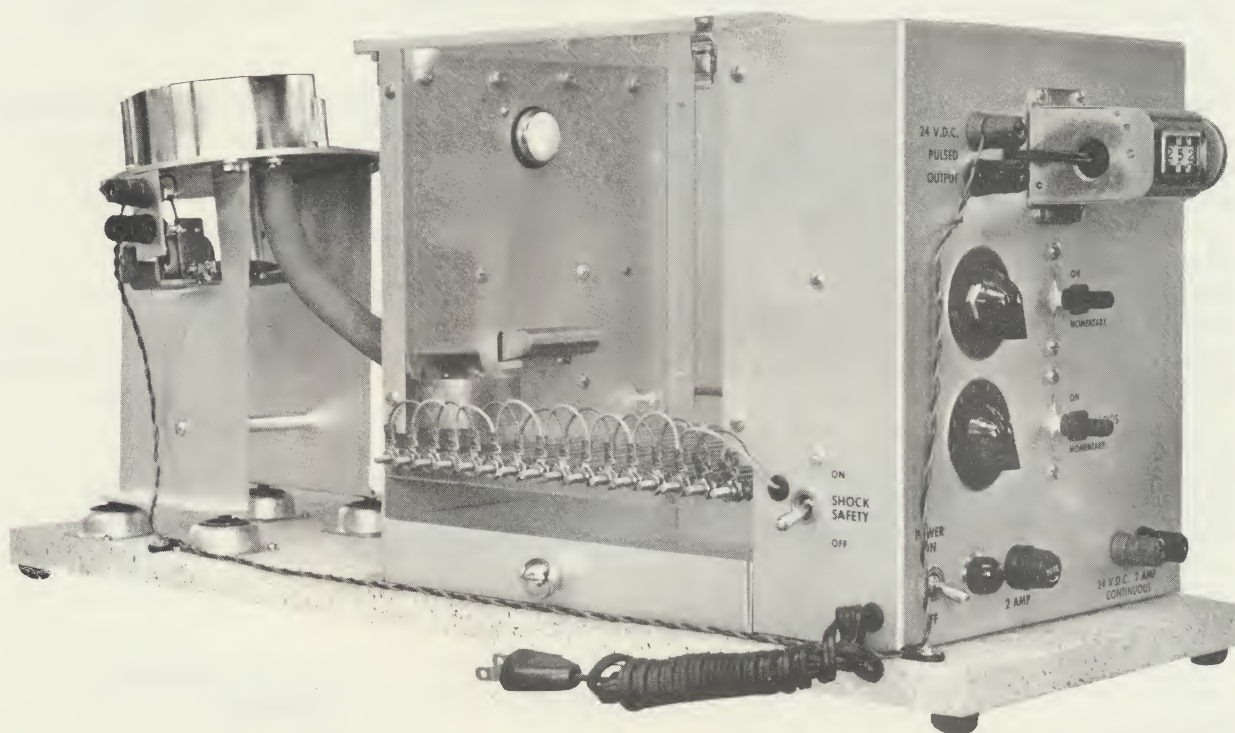
This test chamber is recommended for basic operant conditioning and training with positive reinforcement.

Shipping weight is approximately 20 lbs.





## RODENT TEST CAGE MODEL A-106/D-700



The A-106/D-700 rodent test cage consists of the basic test cage plus a piggy-back control unit with a built-in shock source.

The cage has two Lucite side panels and a ventilated Lucite top (with a retaining latch). The end panels are iridized aluminum and the floor consists of 16 stainless steel bars  $5/32$ " in diameter, located  $9/16$ " on center and insulated for shock application. An iridized aluminum droppings pan is provided. Also included are a food tray, water bottle, cue light, PLS-100 fixed pedal lever, and a D-700 pellet dispenser.

The internal dimensions (above the grid floor) are  $7 \frac{9}{16}$ "H x  $9 \frac{1}{4}$ "W x 8"D. The outside dimensions are  $10 \frac{1}{4}$ "H x  $12 \frac{1}{2}$ "W x  $8 \frac{5}{8}$ "D.

The piggy-back control unit contains a 2-amp, 28 VDC power supply; a 3 digit, manually reset, response counter (permanently wired to the pedal lever); and an adjustable shock source (115 VAC in series with 20K ohms fixed plus 100K ohms continuously variable

giving any short circuit current from 0.96 MA up to 5.75 MA). Cue light intensity is adjustable for three brightness levels. A separate three-position (center-off) silent control switch is provided for both shock and the cue light. Each is spring loaded in one direction, for momentary use, and latching in the other direction, for prolonged use.

Additional provisions are: an auxilliary output from the pedal lever, a pair of power supply terminals (28 VDC, 2-amps total) to operate external equipment, an A.C. power switch, fuse, and pilot light.

The identical model can be supplied with a manual shock scrambler operated by three toggle switches (specify MS), or an automatic, high speed, truly random, eight wire, solid state scrambler in place of the manual scrambler (specify AS). These test cages are adaptable for pellet dispenser and/or liquid dispenser.

The standard A-106/D-700 test chamber is recommended for basic escape avoidance training. With an external clock, the test cage can be used for a variety of programs, including Sidman Avoidance, generalization, and discrimination training. Programs using positive reinforcement are of course easily generated.

The A-106 may be ordered separately. (The base plate for the feeder is not supplied.) The A-106 may also be ordered with a liquid dipper or solenoid valve liquid dispenser.

A-106

A-106/D-700 (formerly A-105)

A-106/L-11 (with liquid dipper - formerly A-108)

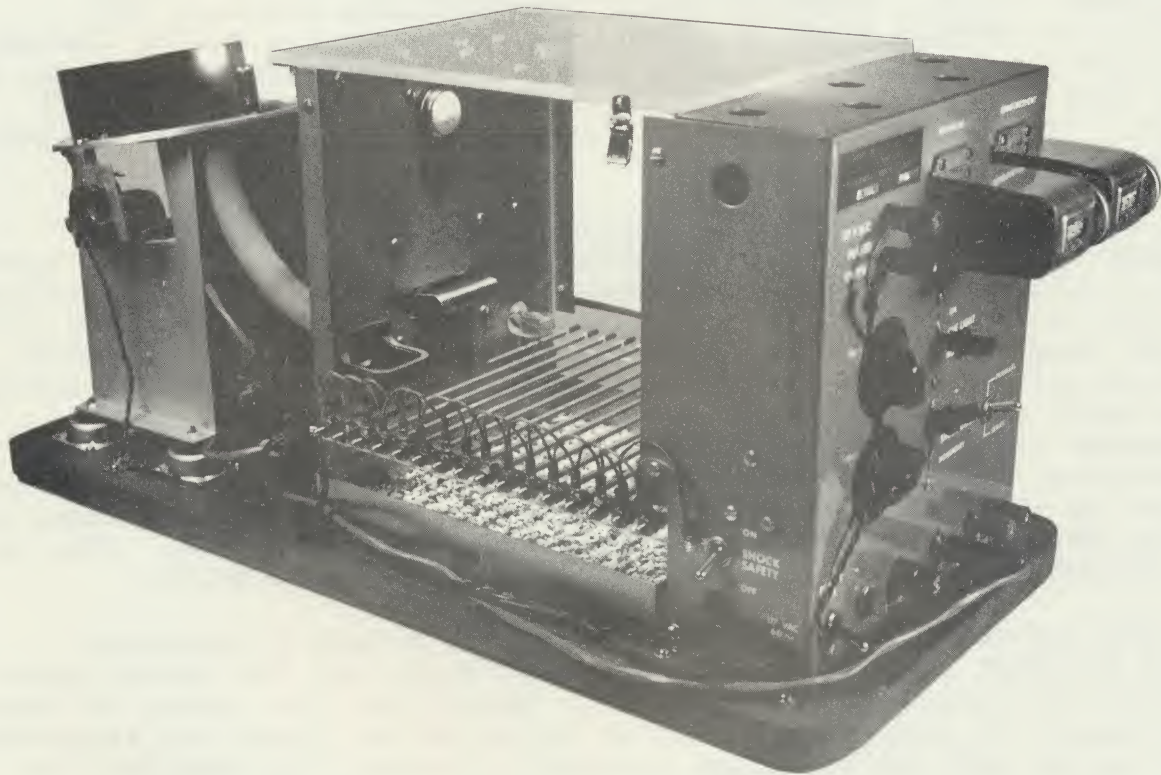
A-106/L-22 (with solenoid valve dispenser)

Shipping weight of the A-106 is approximately 30 lbs. Shipping weight of the A-106 with any feeder is approximately 40 lbs.





## RODENT TEST CHAMBER MODEL A-110/D-700



The A-110 Rodent Test Chamber and the D-700 Feeder provide a low cost student laboratory unit of unusual flexibility.

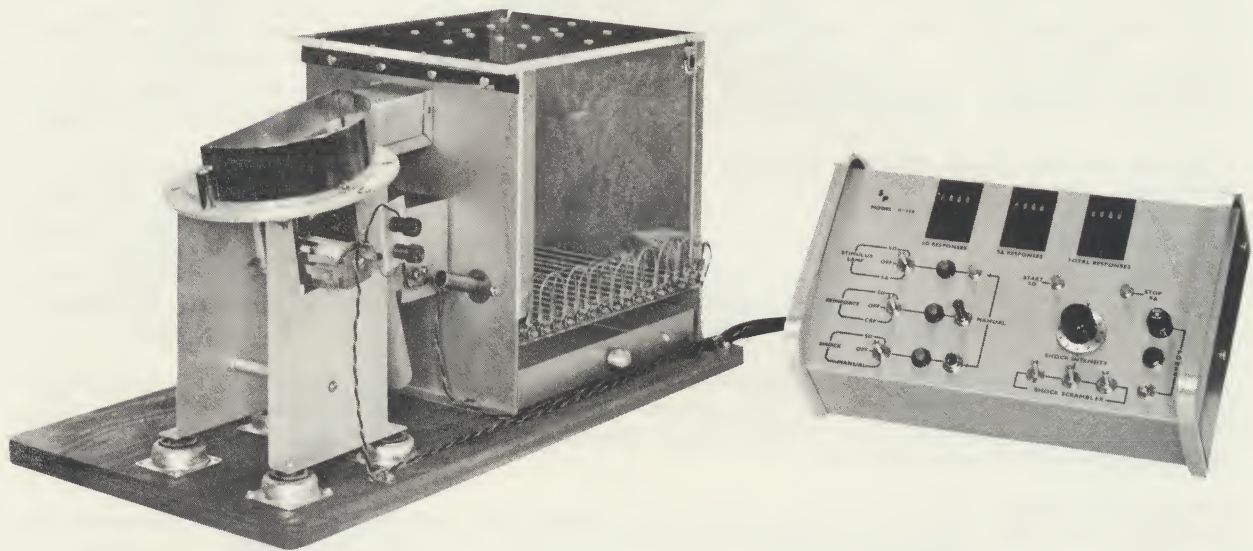
The test chamber has two Lucite panels and a hinged, ventilated Lucite top (with a retaining latch). The internal dimensions (above the grid floor composed of 16 stainless steel bars  $5/32$ " in diameter, located  $9/16$ " on center) are  $7\ 9/16$ "H x  $9\ 1/4$ "W x 8"D. The overall dimensions are  $11\ 1/2$ "H x  $23\ 3/4$ "W x  $11\ 1/4$ "D. The end walls and droppings pan are iridized aluminum. A food tray, water bottle, cue light, and pedal lever are provided and the feeder is supplied with a 1:1 disc for P. J. Noyes 4 mm, 45 mg pellets. The unit is wired and mounted on a plywood base.

The piggy-back control unit contains a 2-amp, 28 VDC power supply; a 3-digit, manually reset response counter permanently wired to the pedal lever; a silent three-position (center-off) switch wired to the cue light (adjustable for 3 brightness levels); and a second three-position toggle switch (center-off) which controls a variable intensity shock source consisting of 115 VAC in series with 20K ohms fixed plus 100K

(over)



## STUDENT LABORATORY TEST CHAMBER FOR RAT MODEL A-115



For simple and sophisticated student laboratory operant work, we now offer the Model A-115 test chamber with the following features:

- 1) One response bar.
- 2) One cue lamp, located above the response bar.
- 3) One automatically operated pellet or water dispenser (optional).
- 4) "Semi-automatic", adjustable-intensity, manually scrambled shock applied to the test chamber floor (16 stainless steel grid bars).
- 5) Lucite sides and top lid for excellent visibility and student observation.
- 6) A flat wood baseplate, which supports the test chamber and dispenser making the entire assembly suitable for table top use.
- 7) A slide-out droppings pan (under the grid bar floor).
- 8) A hand-held control box permanently connected to the test chamber via a six foot cable.



The student "cradles" the separate hand-held control box while observing the rat and controls the test environment by operating switches on the box. The box has three counters which automatically register total responses, reinforcing responses (SD), and non-reinforcing responses (SΔ). There are two alternate and mutually exclusive "states" of the control equipment and the test environment: SΔ interval (the rat's bar-press responses have no effect on reinforcement), and SD interval (the rat's first response gives one reward and/or stops the shock, stops the SD interval, and starts a new SΔ interval).

Each SD interval is started by the student pressing a "Start SD" pushbutton on the box. Once the student has started an SD interval, it persists until the subject's first (SD) response. (The student has a "Stop SD" pushbutton in case the rat does not respond in a reasonable amount of time.)

The stimulus or reinforcement to be presented during the SD interval is selected by three manual toggle switches on the control box. Typically, this selection is made before the start of the experiment and remains the same. Alternately, the selection may be varied for each SD interval by changing the switches during the previous SΔ interval. In any event, the selected stimuli and/or reinforcement is presented only during SD intervals.

One three-position toggle switch is provided for the cue lamp above the response lever ("SD", "off", "SΔ"). A second three-position toggle switch is provided for positive reinforcement ("SD", "off", "CRF"). On CRF, every bar-press gives a reinforcement regardless of SD-SΔ status. The third three-position toggle switch is for scrambled shock ("SD", "off", "manual"). When on "manual", this switch enables the student to shock the rat by pressing a separate "manual-shock" pushbutton, regardless of SD-SΔ status.

There are two additional pushbuttons: the "manual" food pushbutton delivers one positive reinforcement per button-press regardless of SD-SΔ status; the "manual" lamp pushbutton illuminates the cue lamp above the response lever regardless of SD-SΔ status.

There are three manual toggle switches labelled "scrambler" which change the polarity of the grid-bar shock to prevent the rat from learning to stand on bars of the same polarity.

An adjustable shock-intensity control knob, and pilot lights to indicate the selection and the occurrence of environmental events complete the control box.

The Model A-115 test chamber and its control box is a completely self-contained system including 24-28 VDC power.

The Model A-115 test chamber does not include any equipment for automatically starting each "SD interval". The student himself must manually start each SD interval on the basis of a fixed or variable interval or ratio schedule, DRL schedule, DRH schedule, etc. by using the response counters on the control box, and/or the sweep-second hand on clocks or stopwatches available in most laboratories.

The Model A-115 may be operated in conjunction with external tape programmers (automatic VI, FI, VR, FR), timers (automatic FI, DRH, DRL, Shock escape), and recorders. Such external equipment, if any, must be of the conventional 24-28 VDC form (the style which mounts on "power rods" and utilizes "snap leads"). SCIENTIFIC PROTOTYPE Reed Relay Equipment is ideal for this purpose.

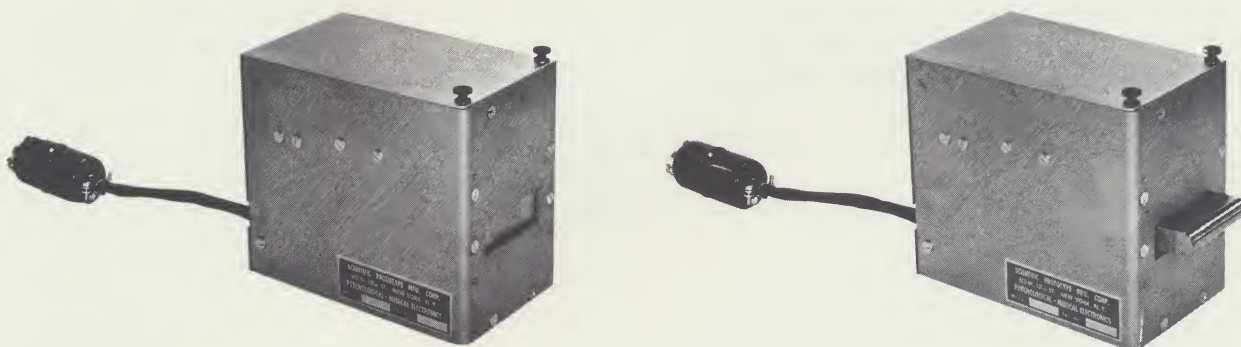
Shipping weight is approximately 45 lbs.

- A-115 (with D-700 pellet dispenser)
- A-115 (with solenoid valve dispenser)
- A-115 (with liquid dipper)
- A-115 (without any feeder)

Feeder, if any, must be specified or D-700 will be supplied.



## RETRACTABLE PEDAL LEVER MODEL RL-200



The RL-200 retractable lever provides a retractable manipulandum to fit all standard SCIENTIFIC PROTOTYPE rodent test cages. The RL-200 fits the same standard mounting pattern as the standard PLS-100. The two units may be interchanged in minutes.

The unit consists of an aluminum housing and a counter-balanced stainless steel pedal. The pedal has a smooth continuous curved surface which is specifically designed to discourage biting or perching. The small force required (18 to 22 gms), plus the good contour, permit the pedal to be used with a variety of small or moderate size animals such as rats, squirrel monkeys, or cats.

Connections to the unit are made through an eight pin octal male connector on a cable at the rear of the unit. A.C. (115 VAC, 60 cps) power is provided through pins 1 and 3. An extend or retract



command is issued by providing a momentary contact closure between pin 2 and pin 3 (30msec. minimum duration). The unit contains an internal memory which will execute the command once initiated (approximately 4 seconds required - either direction). The command must be provided by a floated contact (isolated and not spark suppressed) since 115 VAC rather than 24-28 VDC is being switched (to avoid the need for D.C. at the lever).

Pins 4 and 5 are spare pins. Pin 6 is the normally open output of the pedal lever switch; pin 7 is the arm and pin 8 is the normally closed output (SPDT - break before make - i.e., form C). The N.O. output only is interrupted when the lever is retracted. The N.C. contact is not interrupted to prevent a spurious output (especially if a N.C. pulse former is used).

The lever extends approximately 3/4" into the cage. The trap door which blocks access to the lever when retracted is gravity operated to prevent injury to the subject.

The dimensions are 5"H x 3 9/16"W x 5 7/8"D.

Shipping weight is approximately 7 lbs.

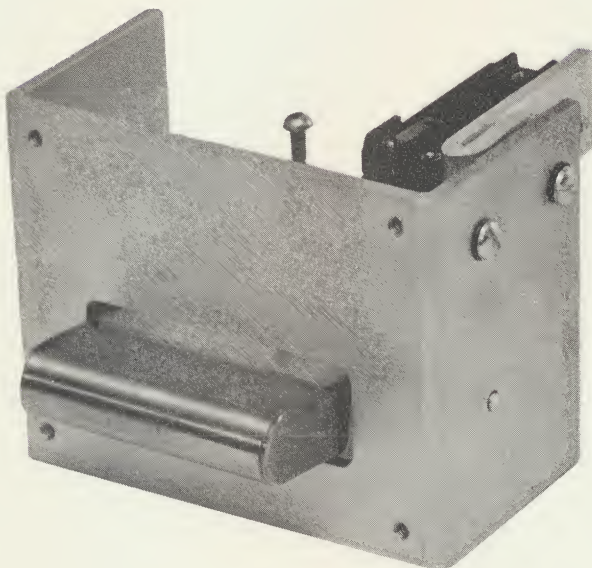
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PEDAL LEVER MODEL PLS-100



The PLS-100 pedal lever is the standard manipulandum for all SCIENTIFIC PROTOTYPE rodent test cages.

The unit consists of an iridized aluminum housing and a counter balanced stainless steel pedal (15 gms sensitivity). The pedal has a smooth continuous curved surface which is specifically designed to discourage biting or perching. The small force requirement, plus the good contour, permits the pedal to be used with a variety of animals of small or moderate size such as rats, squirrel monkeys, or cats.

The PLS-100 fits the standard mounting pattern on all SCIENTIFIC PROTOTYPE cages and may be mounted or removed in minutes.

A SPDT break-before-make output is provided (form C) which will operate with all standard pulse generators (pulse formers).

The dimensions are 2 3/4"H x 3 1/2"W x 4"D.

Shipping weight is approximately 1 lb.



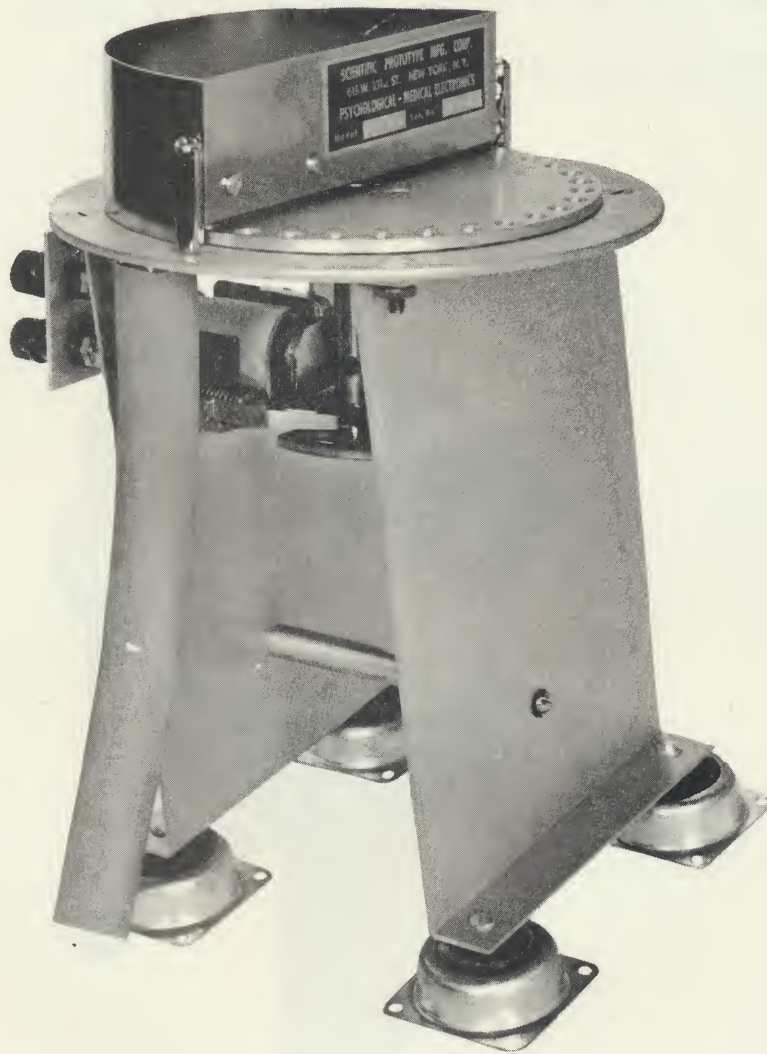
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PELLET DISPENSER MODEL D-700



The D-700 automatic pellet dispenser is a 24 VDC hopper loaded device of moderate capacity. It is specifically designed for P. J. Noyes 4 mm 45 mg pellets. Four shock mounts are provided with the unit to reduce transmitted vibration. Straight chute delivery of the dispensed pellet insures minimum delivery delay.

The standard D-700 pellet dispenser is equipped with a 1/1 ratio disc. Accessory 3/1, 11/1, 33/1, and variable ratio (VR) interchangeable discs are also available.

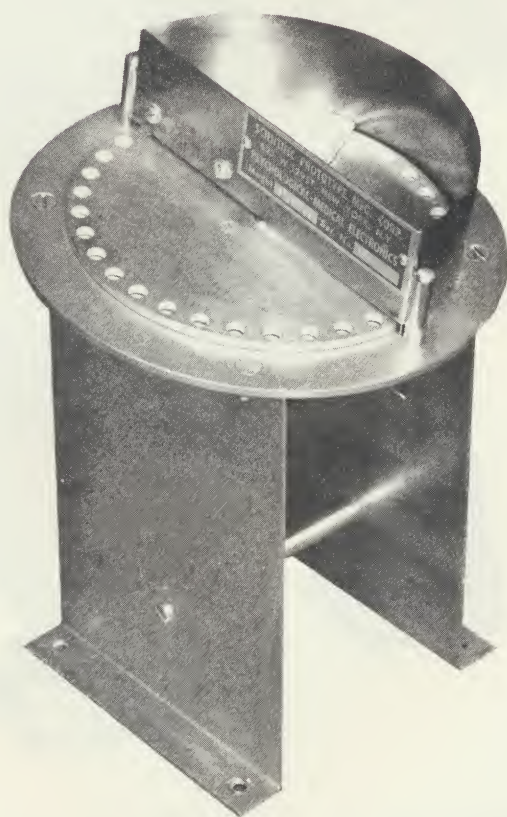
### Typical Applications:

The simplicity, ruggedness, and rapid delivery provided by the D-700 pellet dispenser make the unit ideal for student use. The high reliability and substantial capacity permits unattended operation for relatively long periods of time, such as over a weekend, which is often required in research applications.

For P. J. Noyes 4 mm 37 mg pellets, specify D-701.

For P. J. Noyes 4.8 mm 97 mg pellets, specify D-702.

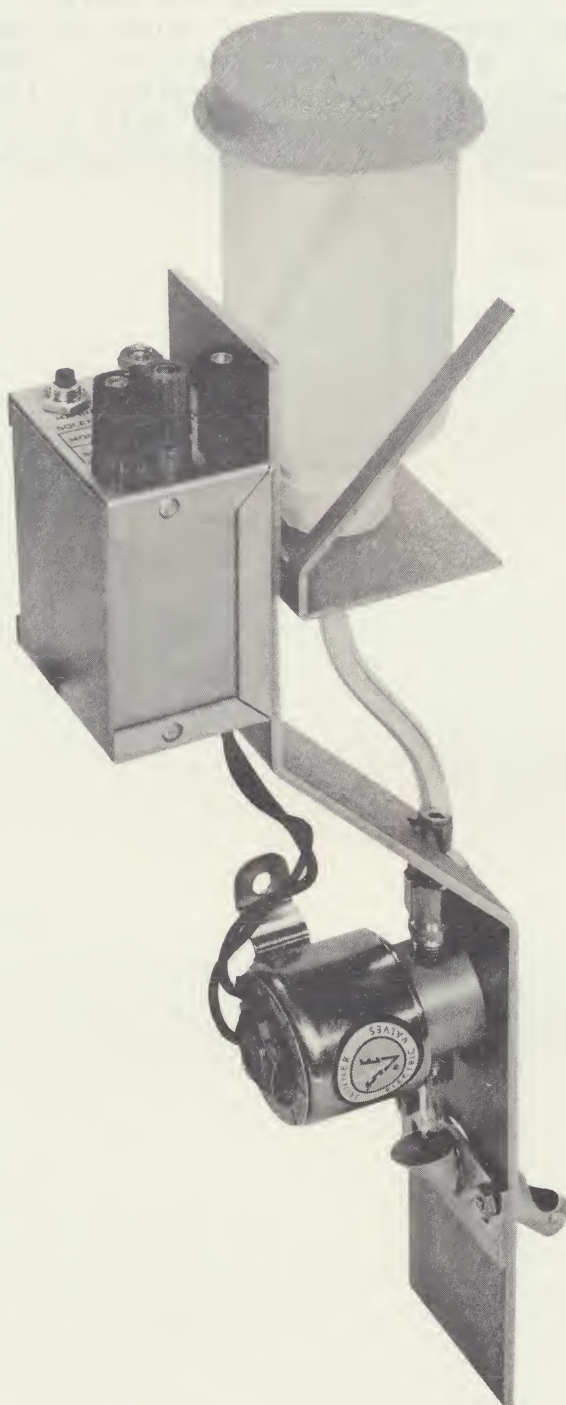
Shipping weight is approximately 8 lbs.







## SOLENOID VALVE LIQUID DISPENSER MODEL L-11



The L-11 solenoid valve liquid dispenser is a 24 VDC feeder of moderate capacity designed to provide an adjustable and reproducible quantity of liquid which will accumulate if not consumed immediately. It will operate with water and liquids of similar viscosity. The valve body and associated piping are immune to chemical attack by commonly used liquids and cleaning solvents but care should be employed when milk, sugar water, or similar liquids are dispensed since long periods of idleness can result in a residue which may alter the orifice area, or gum adjustments, or the valve seat. If potentially gummy liquids are used, the dispenser should be flushed with water before storage or prolonged inactivity.

An adjustable needle valve is provided, integral with the solenoid valve, to adjust the flow rate.

An integral pulse generator is provided to hold the valve duration fixed independent of the duration or rate of occurrence of the input (which may be any value from 5 msec. to  $\infty$  with a rep. rate up to about 3 per second - primarily limited by the inertia of the liquid column).

The valve duration is adjustable within small limits. The combination of duration and

flow rate adjustments permits the quantity of liquid dispensed on each cycle to be set at almost any usable value and accurately reproduced. A manual pushbutton is provided for hand-shaping use.

The L-11 liquid dispenser mounts directly on the equipment end wall of all current SCIENTIFIC PROTOTYPE A-100 series cages and will fit all earlier cages with the addition of two small (#28) mounting holes.

The capacity of the reservoir (150 ml) is sufficient for unattended operation for relatively long periods of time, such as over a weekend, which is often required in research applications. The simplicity and reliability of the unit make the L-11 suitable for student use. The unusually small delivery delay makes this unit especially useful in programs requiring maximum reward effectiveness, such as very high ratio programs.

Shipping weight is approximately 7 lbs.





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## CAGE END PANELS

Interchangeable end panels are available for all rodent test cage series.

Blank iridized end panel	50
Punched for food tray, 1 pedal lever and water bottle - food tray and water bottle clamp supplied	51
Punched for food tray, 1 cue light, 1 pedal lever, and water bottle - food tray and water bottle clamp supplied	52
Punched for liquid dipper, and 1 pedal lever	53
Punched for liquid dipper, 1 pedal lever, and cue light	54
Special panels - punched for any practical combination of levers, dippers, feeders, and lights - Please specify	50-S

## Limitations:

Maximum number of cue lights: 3.

For more than 1 cue light, no light intensity control can be provided within piggy-back control units.

If 2 feeders are required, only 1 lever can be provided.

If 2 levers are required, only 1 feeder can be provided.

STANDARD FOOD TRAY (FT)

Bronze pellet trough with spout.

1/2" O.D. brass tube.

Mates for 1/2" I.D. rubber tubing or equivalent. For pellet dispenser type D-700 or similar units.

STANDARD WATER BOTTLE (WB)

The standard water bottle (50 ml volume) provides free liquid access. It will fit all SCIENTIFIC PROTOTYPE cages punched for a water bottle and provided with a mounting clamp. It will not fit the A-100 (50) (i.e., blank end wall) or any cage punched for a liquid dipper or solenoid valve dispenser.

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### SPECIAL RODENT TEST CAGES

Within the basic geometry of the A-100 series cages, a wide variety of special systems can be constructed. Double length boxes with equipment on one or both end walls have been used for shuttle boxes (with or without barriers and deroosters - tipping switches, photocell detectors, shock pits, etc.). Couplers allow assembly of long runways and T couplers allow mazes to be built. The geometry may be altered for tunnel mazes and close grid spacing provides excellent test equipment for mice (using either a standard vertical pedal lever or our special horizontal bi-directional lever designed for "escape-collision" training).

Special cages with large diameter aluminum tubes in place of the standard stainless steel bars (Dinsmoor Boxes) are also available on special order.

We have built special test boxes for everything from crayfish to dogs. Please consult SCIENTIFIC PROTOTYPE when special cages are required.



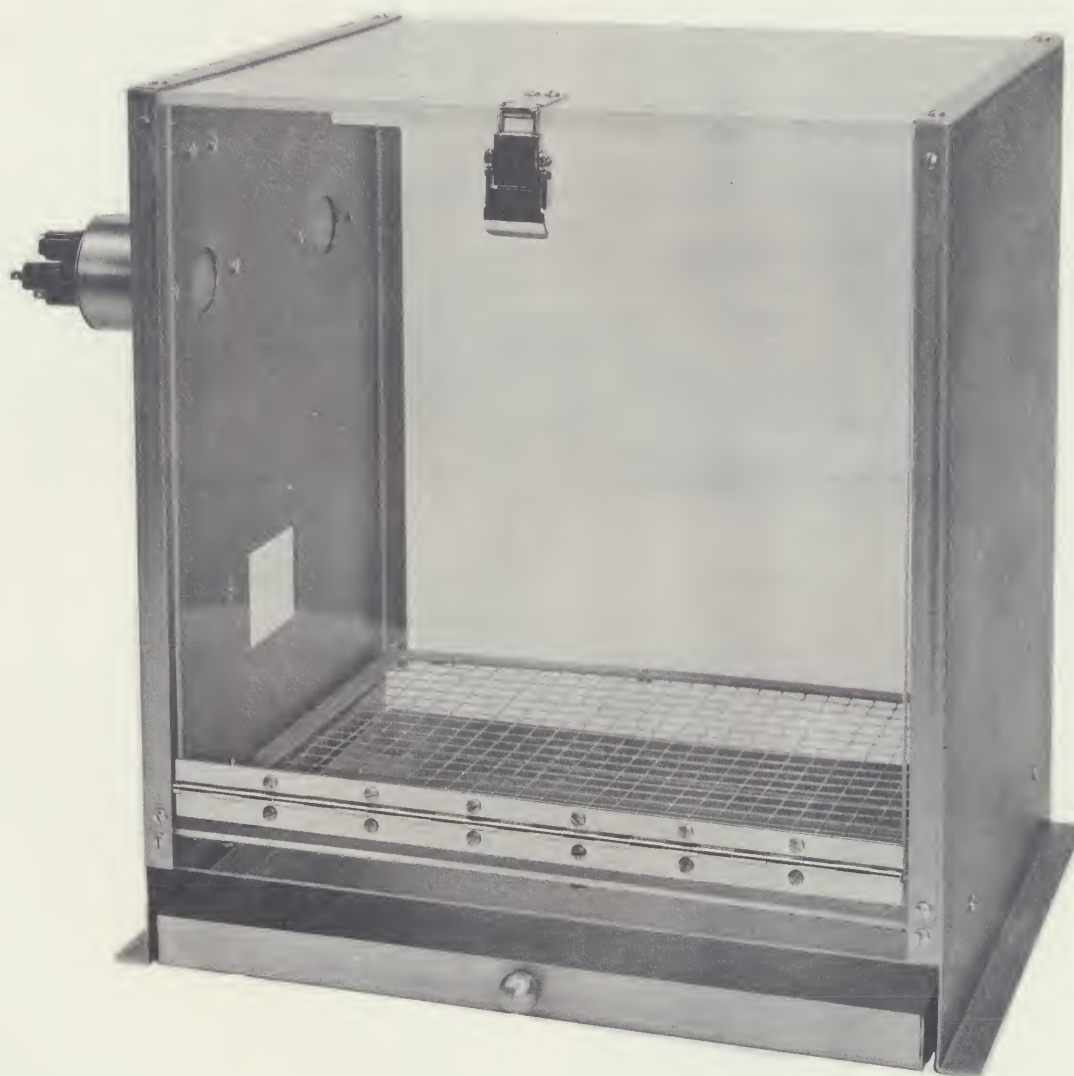
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PIDGEON TEST CHAMBER MODEL B-200



The new B-200 pidgeon test chamber is a low cost, versatile, durable unit for demonstration, student laboratory use, or advanced research. The cage is unusually spacious (15"W x 12"D x 14"H). The overall height (16½") will easily accommodate even the largest laboratory birds, without providing sufficient area for the subject to wander off and become distracted.

Two clear Lucite walls and a ventilated Lucite top provide excellent viewing for demonstrations and student use. A large hinged side panel gives easy access to the subject, even for inexperienced personnel. The open mesh floor provides a secure perch for the subject and the removable droppings pan allows rapid cleaning. The iridized aluminum walls and stainless steel mesh floor are durable and easily cleaned.

Two types of interchangeable pidgeon keys are available. One provides a conventional form C (SPDT - break before make) output for use with any N.O. or N.C. pulse generator (pulse former). The second type provides a bounceless form A output which is suitable for direct entry into solid state systems without any interface buffer. Either type may be ordered with a frosted face, for use with a multi-color lamp housing (a three color unit is shown in the photograph) or with a clear face for use with in-plane symbol projectors.

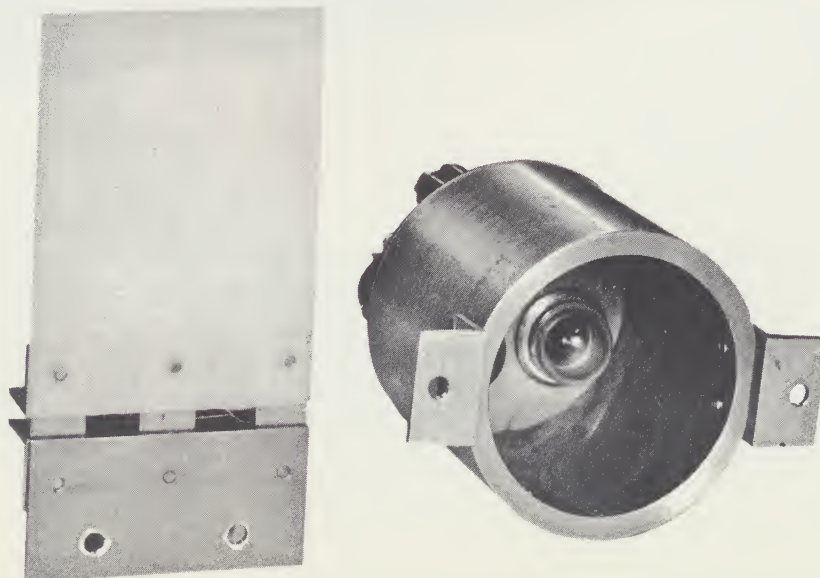
A cutout is provided for mounting a standard grain feeder.

The B-200 pidgeon test chamber is a carefully designed and rugged device which provides an economical solution to the problem of demonstration and/or student laboratory work. The ability to comfortably fit this cage into a standard SPC-300 sound-proof chamber (including lights, keys, and a feeder) permits advanced research to be conducted in the same chamber which accommodates A-100 series rodent test chambers without the necessity of purchasing a complete integral cage and chamber system specifically for pidgeon use.

Modifications can be made to suit your requirements.

- B-200 Pidgeon Test Cage
- K-100 Standard Pecking Key  
(specify clear or frosted target)
- K-200 Bounceless Pecking Key  
(specify clear or frosted target)
- L-100 Three Color Back Illuminator

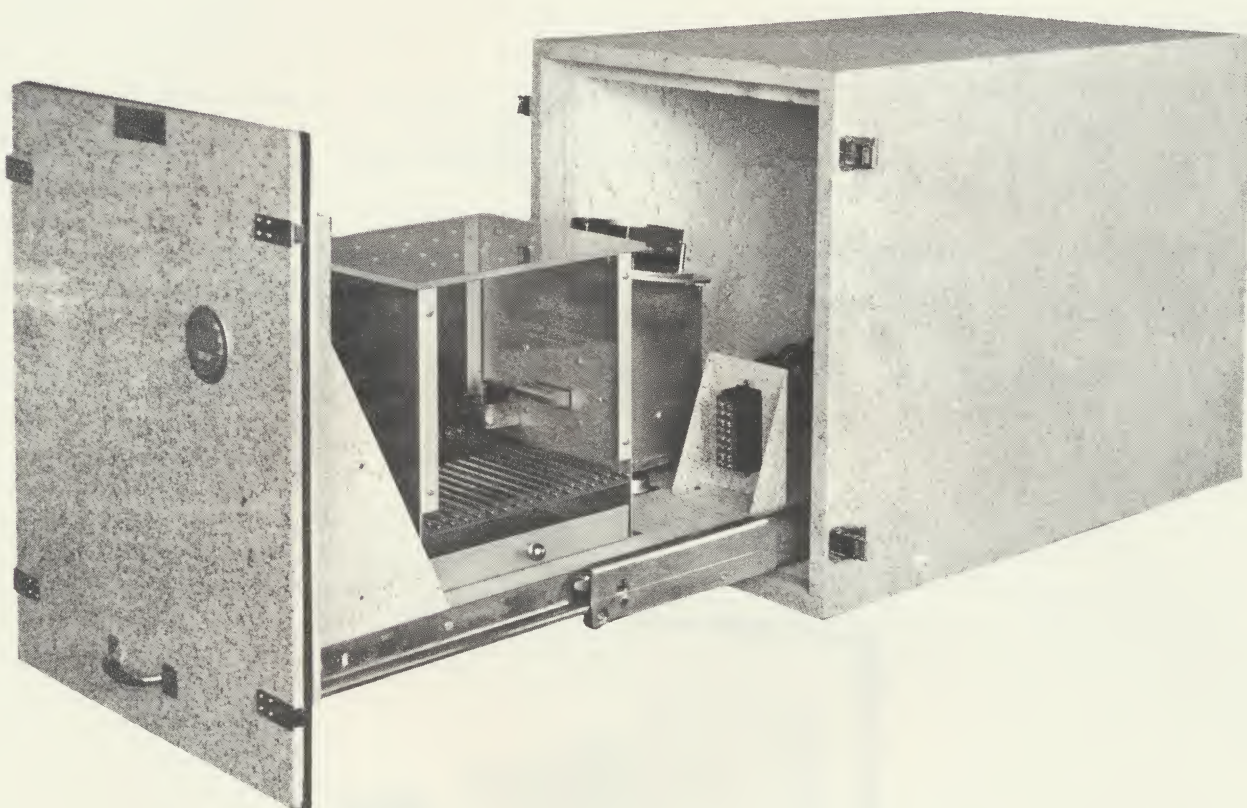
Shipping weight of the B-200 is approximately 18 lbs.







## SOUND-PROOF CHAMBER MODEL SPC-300



The SPC-300 sound isolation chamber is a general purpose, sound attenuating enclosure for any rodent (series A-100) or pigeon (series B-200) test cage (without piggy-back, for external programming and controls only). The usable interior dimensions are 19"H x 12 1/2"W x 26 1/4"D. The exterior dimensions are 22"H x 17"W x 36"D. All cages, plus appropriate feeders, will fit comfortably within the enclosure.

The rectangular shape permits vertical stacking (like a multi-drawer file cabinet), and the front and internal bottom sections slide out on full length, nylon bearing slides (again, as a file drawer). The entire front and bottom are removable for equipment mounting and modification. The interior wiring (21 wires) is provided by self-retracting, flexible cables which provide entry from external plugs at the rear of the enclosure to a single socket at the rear of the sliding section (which simply unplugs for removal).

Forced ventilation is provided by a low noise blower and sound absorbing ducts at front and rear.

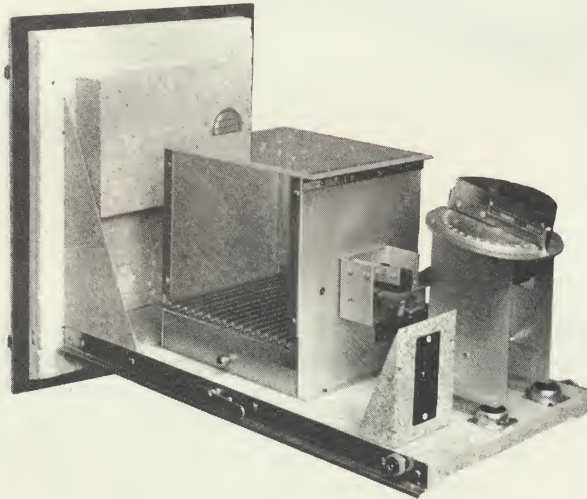
Measured sound attenuation for a white noise source and a standard type A spectrum is 34 db. This is the same attenuation as provided by the much heavier and less convenient perforated metal and Fiberglas units which preceeded the use of modern light-weight plywood and acoustic tile construction.

Optional Features:

A 7 Watt, 115 VAC house light (pre-wired); and/or a wide angle peep hole or double glass viewing window on the side or on top is optional. The peep hole has a negligible effect but the viewing window reduces attenuation 4-6 db.

The sound-proof chamber is shown above with a rodent test cage (A-100), a pedal lever (PLS-100), and a pellet dispenser (D-700) (not included).

Shipping weight of the chamber (without cage) is approximately 100 lbs.





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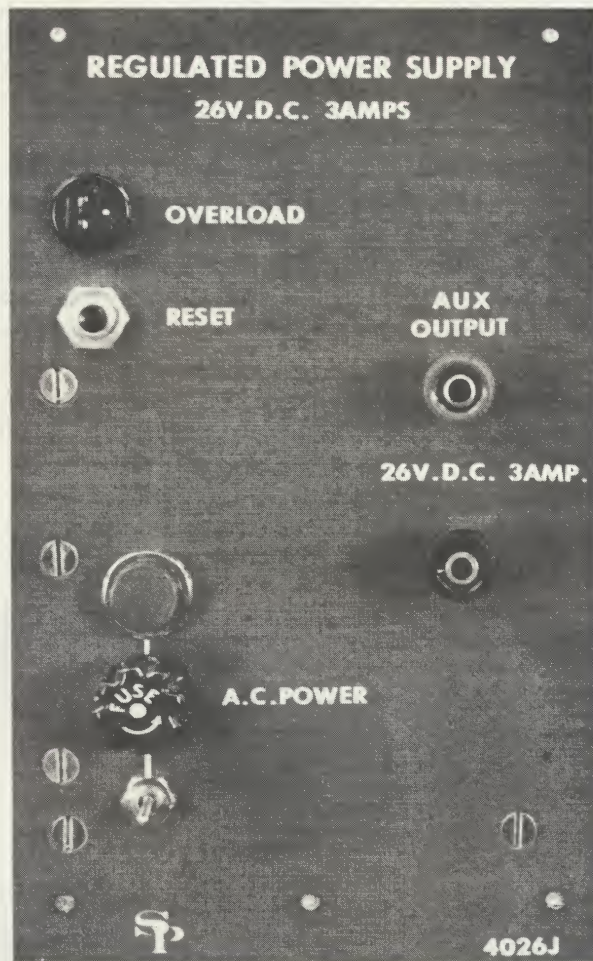
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REGULATED POWER SUPPLY MODEL 4026-J

(26 VDC, 3-AMPS)



The 3-amp Regulated Power Supply (4026-J) provides a convenient general purpose power source for programming and control systems. It has been specifically designed for long and reliable service and will provide appropriate power for all programming equipment including SCIENTIFIC PROTOTYPE reed relay devices. The Regulated Power Supply clips on standard 6 1/2" power bars, providing power directly to these bars (+26 VDC on top, ground on bottom) when in operation. Front panel output connections are also included. The unit operates on standard 60 cycle, 115 VAC and will operate satisfactorily on line voltages from 105-125 VAC.

If desired, the unit may be enclosed in a portable carrying case, at a slightly higher cost.

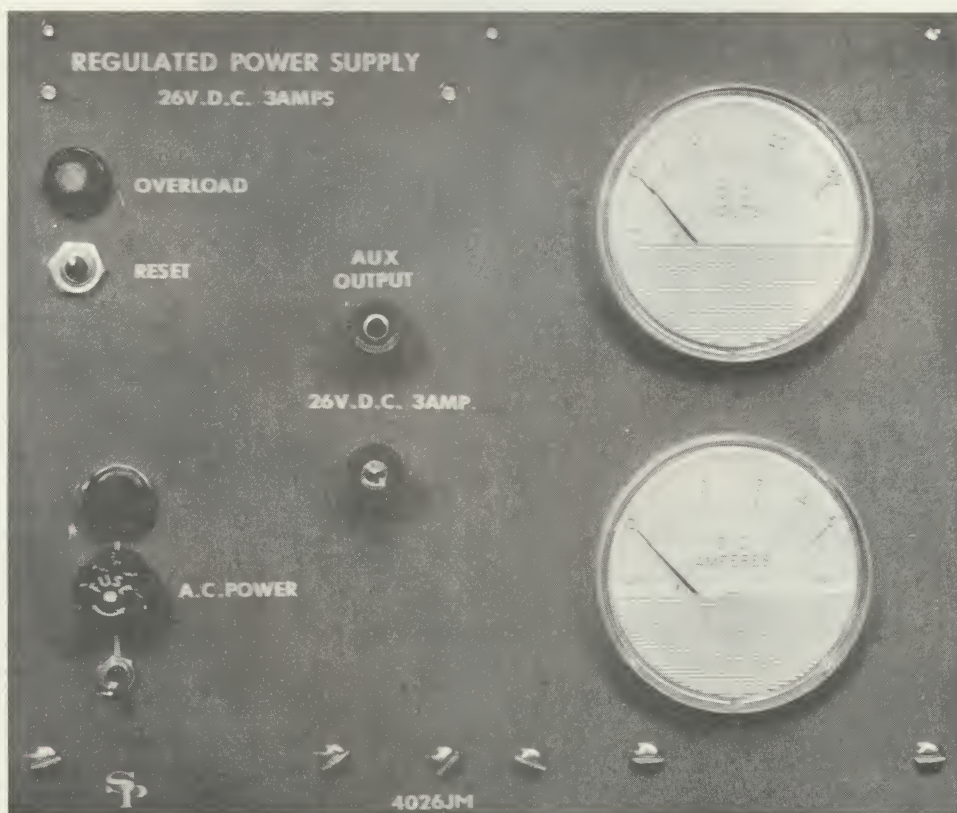
Regulation of the output voltage over the full current range is 1%. Maximum ripple is less than 10 millivolts, and a step load from zero to 3 amps will produce a transient excursion of no more than 300 millivolts.

The front panel contains an overload indicator which lights up in the event of a short circuit or an overload. In addition, there is a pilot light which is on whenever the supply is on (even during overload). The 3-amp fuse on the panel is exclusively for protection against internal failure of the power supply. It does not blow and will not need replacement after output overloads or short circuits. A manual reset pushbutton is provided to restore the unit to normal operation following an overload or short circuit.

#### Typical Applications:

The small size (1/4 rack width) and power rod mounting make the 4026-J ideal for program and control systems complete in a single relay rack. Most systems of this size will find a 3-amp power supply sufficient. The 4026-JM is an identical unit (except for 1/2 rack width) which includes output voltage and current meters. For larger systems the 10-amp Regulated Power Supply (4027-J) is recommended.

Shipping weight of the 4026-J is approximately 14 lbs.





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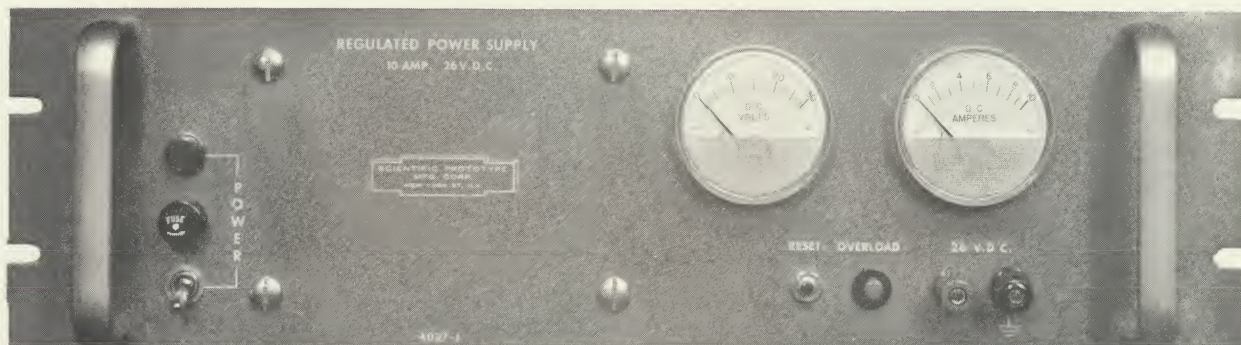
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REGULATED POWER SUPPLY MODEL 4027-J

(26 VDC, 10-AMPS)



(VOLTMETER AND AMMETER OPTIONAL)

The 10-amp Regulated Power Supply (4027-J) provides a convenient general purpose power source for programming and control systems. It has been specifically designed for long and reliable service and will provide appropriate power for all programming equipment including SCIENTIFIC PROTOTYPE reed relay devices. The Regulated Power Supply is built on a standard 19" rack panel 5 1/4" high which bolts directly to a standard equipment rack. Output is provided on front panel binding posts. The unit operates on standard 60 cycle 115 VAC and will operate satisfactorily on line voltages from 105-125 VAC.

Regulation of the output voltage over the full current range is 1%. Maximum ripple is less than 10 millivolts, and a step load from zero to 10 amps will produce a transient excursion of no more than 300 millivolts.

The front panel contains an overload indicator which lights up in the event of a short circuit or an overload. In addition, there is a pilot light which is on whenever supply is on (even during overload). The 3-amp fuse on the panel is exclusively for protection against internal failure of the power supply. A

manual reset pushbutton is provided to restore the unit to normal operation following an overload or short circuit.

Typical Applications:

The small size and large power handling capacity of the 4027-J make this unit attractive for moderate size systems without consuming excessive rack space. For smaller systems, the 3-amp Regulated Power Supply (4026-J), which clip mounts on power bars, is recommended. An identical unit, 4026-JM, is available with output voltage and current meters.

Shipping weight of the 4027-J is approximately 46 lbs.





## CUMULATIVE RECORDER MODEL CR2D



The cumulative recorder is the most practical and popular apparatus for graphically recording learning curves in behavioral studies.

The CR2D compact cumulative recorder is a completely self-contained unit with the control panel integrated into the face of the recorder itself. The CR2D clip mounts on standard 24 to 28 VDC power bars (8 1/2"W x 7"H x 8 1/4"D) and two units will mount side by side across a single pair of rods.

A synchronous motor paper drive provides 12" per hour chart speed (standard). Other chart speeds (up to 36" per hour) may be provided by substituting appropriate interchangeable drive motors. A paper stop control input is provided at a front panel stud.

The pen carriage travel is adjustable from 2 to 5 inches and either 100 or 200 steps per inch may be selected by an internal quick-change mechanism.

The lead-screw carriage drive assures excellent linearity and a constant tension reset system permits resetting from any position. A full 5" reset operation requires less than 0.5 seconds. A manual reset pushbutton is provided for operating convenience.

The main recording pen is mounted on a solenoid to provide reinforcement marks. A separate additional event marker (E) may be added to the left side of the unit (optional), and may be used as a time marker in connection with any external timer.

The pen, or pens, are connected for a single common ink reservoir with sufficient capacity for approximately three days of continuous operation.

The maximum operating speed is guaranteed to be 30 operations per second and even at maximum speed, reliability and life expectancy are excellent.

The CR2D is supplied with 2 ounces of ink, a pen filling syringe, a pen cleaner, a suction bulb ink starter and an initial roll of standard 6 1/2" wide blank recording paper at no extra charge.

SCIENTIFIC PROTOTYPE unconditionally guarantees all material and workmanship, for a period of one year in normal use from the date of delivery.

Shipping weight is approximately 13 lbs.

#### Optional Accessories

- Event Marker (E) (Specify CR2DE)
- Replacement Paper
- Replacement 2 oz. bottle of ink
- Filling syringe
- Pen cleaner
- Ink starter suction bulb

For the recording of time relationships, such as response latencies, the 4 channel event recorder (4070-J) is recommended.



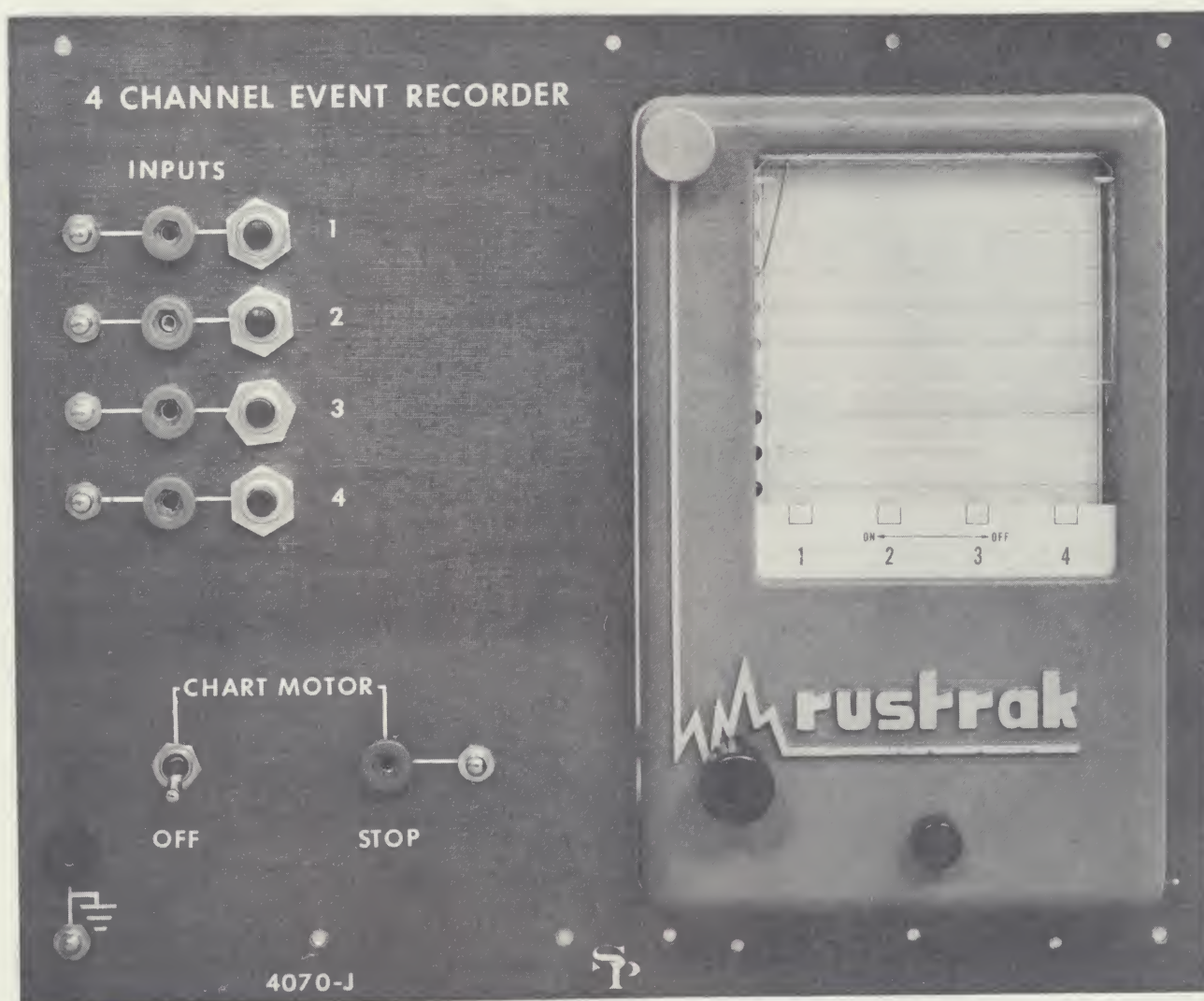
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4-CHANNEL EVENT RECORDER MODEL 4070-J



The multi-channel event recorder is the most practical device for graphically recording and displaying the time of occurrence, duration, and time relationship between a number of independent events. The 4070-J 4-channel event recorder is a simple, relatively inexpensive unit designed around a rugged, industrial Rustrak recorder. The unit uses cartridge-loading pressure-sensitive paper which is simple to load and provides sufficient capacity (60 feet) for most applications. No ink feed is needed and blotting and drying are eliminated. Standard chart speed is twelve inches per hour (#12 gear box, 2 rpm motor). The following table gives chart speeds available on special order:

Motor Speed	Gear Box Number										
	# $\frac{1}{4}$	# $\frac{1}{2}$	#1	#2	#3	#6	#10	#12	#15	#30	#60
	<u>Chart Speed in Inches Per Hour</u>										
2 rpm	$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	6	10	12	15	30	60
8 rpm	1	2	4	8	12	24	40	48	60	120	240
60 rpm	7 $\frac{1}{2}$	15	30	60	90	180	300	360	450	900	1800

The 4070-J clip mounts on standard 24-28 VDC power bars (plus 115 VAC for the chart motor). A direct coupled input is provided for each of the four channels, plus a manual input pushbutton. A continuous trace is provided for each channel with the trace deflected horizontally for the duration of the input. The maximum electrical response speed is 20 cps but the maximum usable speed is set by the chart resolution. Maximum usable response/sec. = chart speed (inches per hour)/180.

A chart motor switch and electrical stop input are also provided.

The 4070-J is a highly refined system element and is unusual in providing special features not usually found in low cost equipment. An access window is provided to permit notes to be written on the chart before it is removed. A tear-off feature is also provided to permit removing sections of the record without opening the recorder and unspooling the chart.

The drive circuit contains a special forcing circuit for each channel to provide maximum response speed plus burn-out proof maintained drive. The coils driving the event pens within the recorder are intermittent duty and are not burn-out proof themselves. The special drive networks are required to permit long duration events to be recorded safely.

The event recorder is an excellent device for measuring response latency, IRT, response duration, and for displaying program operation: stimulus presentation, reward delivery, etc. The simple loading system and burn-out proof drive make this unit suitable for student use.

Shipping weight is approximately 5 lbs.





## INTERVAL TIMER MODEL 301 G



The 301 G interval timer is a completely transistorized unit in a portable case, designed for reliable long-term service.

It provides 3PDT start and stop output relays with 5-amp contacts (unless 2-amp bifurcated contacts are specified for higher contact reliability at the expense of current-carrying capacity).

The time interval ranges from .01 sec. to 11 sec. in 3 overlapping direct reading ranges. An additional 110 sec. range is optional. Timer accuracy is guaranteed to be  $\pm 2\%$ , short-term repeatability  $\pm 1\%$ . The propagation delay associated with relay closures is approximately .015 sec., with direct front panel logical connections about .000001 sec.

The relays in the 301 G are plug-in replaceable. The condensers used in this timer are not conventional electrolytics, but very stable long life solid slug tantalum capacitors and mylar paper capacitors. All power supply semi-conductor elements are silicon. The logic section operates from a regulated power supply to eliminate the effect of line voltage variation on time interval.

A special internal memory is provided to permit self-resetting through the stop relay normally closed contacts. Auxilliary connections are provided for remote start and reset, remote pilot lamp drive, and master/slave interconnections for re-setting sets of timers.

For increased flexibility, the following accessories are provided:

- a remote control box to start and reset timer, with start and stop indicator lights,
- PL-55 patch cables to allow any timer to reset an entire group of timers, and
- signal cables to allow direct logical connection of groups of units without the use of relay contacts, thus avoiding the propagation delay associated with relay closures.

Shipping weight is approximately 15 lbs.



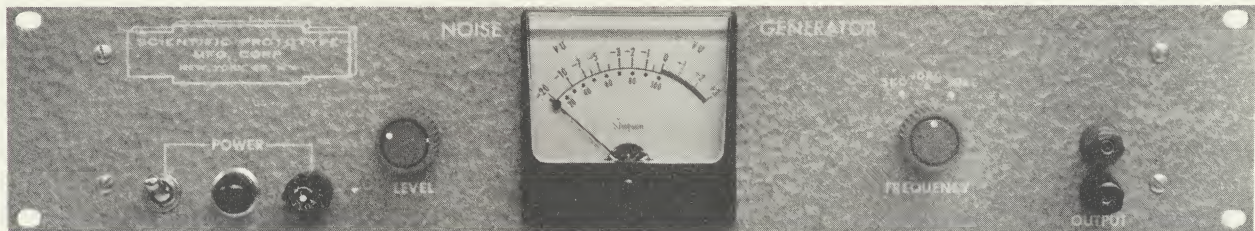
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NOISE GENERATOR MODEL 381-G



The 381-G noise generator is a self-powered (115 VAC) source of white noise which is mounted on a 3 1/2" gray rack panel. The entire unit, including the noise source, is entirely solid state, extremely rugged, and is not subject to microphonics caused by mechanical vibration which has plagued vacuum tube units.

An internal low pass filter with a fixed 6 db per octave slope permits selection of the noise bandwidth upper cut-off frequency (5KC, 10KC, or 20 KC).

A level (volume) control is provided to adjust the output signal (which is monitored by a V.U. meter). The nominal average output is 0.75 VRMS across a 600 ohm load.

The unit is designed to operate with any load of 600 ohm or higher. The line level output is not intended for loudspeaker drive and should be used with a power amplifier such as the 382-G (and a clickless audio switch such as the LDR switch 4042-J, if required).

The 381-G is typically used as a source of white noise for masking or stimulation in either operant or human audiometry experiments.

Shipping weight is approximately 9 lbs.

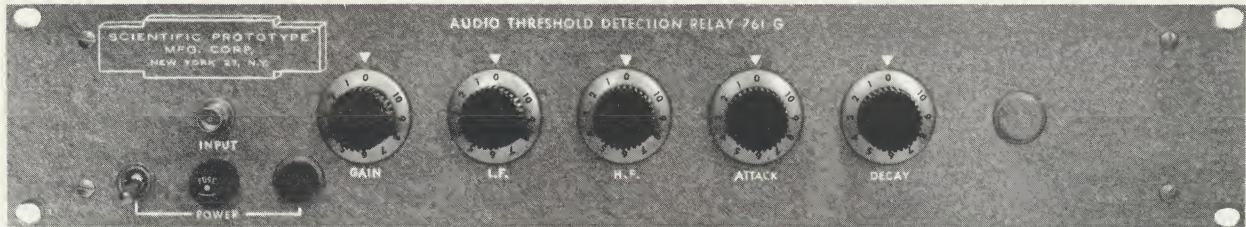
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AUDIO THRESHOLD RELAY (VOICE KEY) MODEL 761 G



This audio level detection relay is often used as a sound-actuated relay or "voice key". The unit is completely transistorized and is supplied complete with microphone.

An audio input signal above any adjustable threshold will result in a relay contact closure which may be used to operate any control or recording equipment. A gain control is provided to adjust the operating threshold (which will prevent ambient sounds from operating the relay) and high and low frequency filter controls allow adjustment of the sensitivity of the switch to the upper and lower ends of the auditory spectrum.

In addition, the unit has separate "attack" and "decay" controls for the adjustment of the build-up and fall-off time of the D.C. relay control signal derived from the incoming audio signal. The "attack" control permits adjustment of the relay sensitivity to "spikes" or fast rising wave forms - allowing the elimination of voice key response to all but sustained sounds. The "decay" control adjusts the fall-off time of the signal to either "smooth over" pauses if required, or to leave pauses intact (as in speech pattern analysis).

The "voice key" may be used without a microphone for the analysis of any audio frequency electrical signal.

The unit is rack mounted on a 3 1/2" x 19" gray aluminum panel and is self-powered.

Shipping weight is approximately 11 lbs.



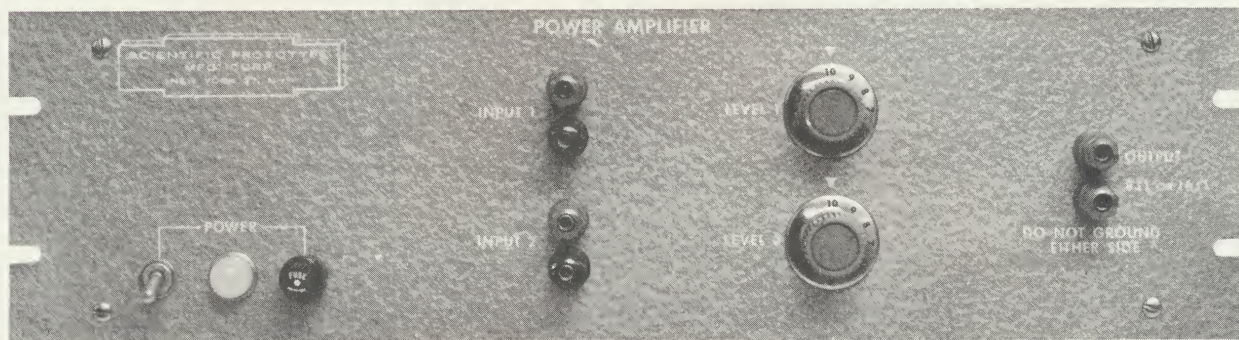
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POWER AMPLIFIER MODEL 382 A



The 382 A audio power amplifier is an excellent solid state, general purpose, audio amplifier, rack mounted on a 5 1/4" gray panel, and based on a completely transistorized design without any output transformers. All components are computer grade.

This amplifier features an extremely low internal impedance and virtually no transient overshoot. It has a flat frequency response between 20 cps and 20KC.

It may be used with any 4, 8, or 16 ohm load. The output provides 20 Watts continuous duty with an 8 ohm load.

Two pairs of input binding posts are provided, and two level (volume) controls to permit adjustment of the output.

The amplifier is typically used in connection with the noise generator Model 381 G or any oscillator in audiometry with any loudspeaker system.

Shipping weight is approximately 11 lbs.

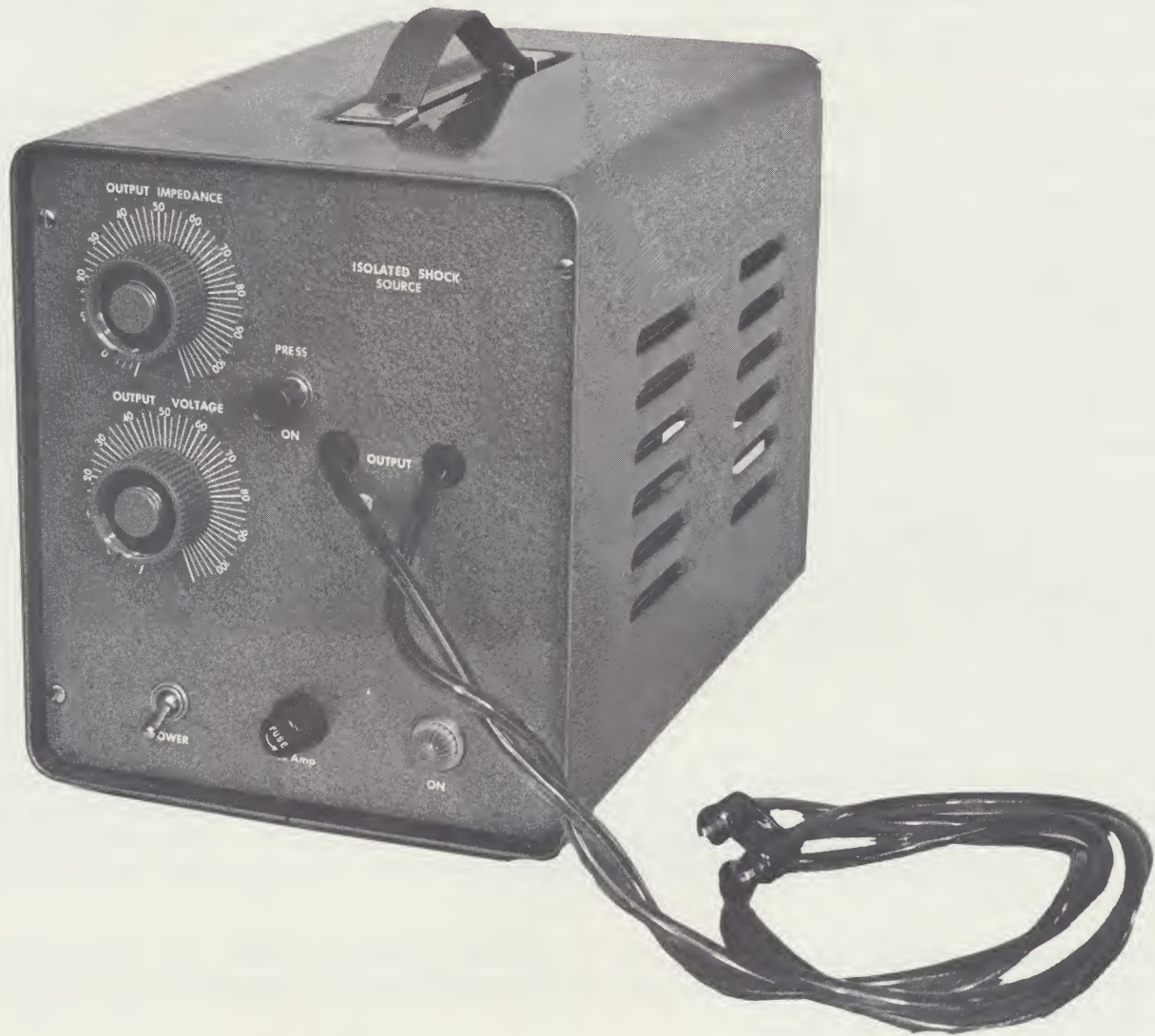
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A C ISOLATED SHOCK SOURCE MODEL SS 13  
and SS-313, SS-313H, X-313, X-313H, XA-313, XA-313H



The AC shock source consists of an AC shock current generator plus output controls housed in a portable case. The unit is completely solid state. It may be operated manually (by push-button) or by remote switch closure (e.g., in connection with timers, counters, etc.). The minimum shock duration recommended is 50 milliseconds (operating speed- 10 operations per second maximum).

Isolation is achieved by a special transformer with a maximum interwinding capacity of 1 mmfd. Total capacity to surroundings is approximately 5 mmfd.



The circuit voltage is adjustable from 1 to 160 VDC. The output impedance (resistance in series with the subject) is adjustable from 100 ohms to 100K ohms.

For longer shock durations, additional ripple filtering may be added. If the minimum duration required is known to be longer than 50 msec., please specify the actual minimum duration required on the order.

This unit is primarily intended for shock or stimulation applications requiring maximum isolation of the shock source, such as shock during EEG recording. While isolation is never perfect, stray coupling is remarkably low in this unit.

The SS-313 is a closely related non-isolated D.C. constant current generator for stimulation or shock application. This unit provides a regulated constant current output between a negative output terminal and ground. The output is set by a direct reading 10-turn precision control (11:1 range) and a three-step decade multiplier. The standard unit spans the range from 0.01 MA to 11 MA in three overlapping, direct reading ranges. The compliance range of the unit is over 250 Volts. Rise and fall time are on the order of 0.01 msec. for a resistive load. A high power version is available with an additional current range, model SS-313H, which has a maximum output current of 110 MA. Caution: this is a *very* dangerous shock level and should never be applied in the head or chest areas.

The X-313 is identical to the SS-313 with two exceptions. First, the output is entirely floating with the isolation approaching the SS-13 in its completeness. However, to achieve this degree of isolation in a system which can be switched on and off from a normal external signal, optical coupling has been used to connect the control system to the current generator. A beam of light is substituted for an electrical connection to leave the output isolation intact. The photoresistor employed as the "receiver" for the light signal sets the limiting speed for current rise and fall at about 5 msec. turn-on and 10 msec. turn-off. A high powered X-313H is also available. Where a switching speed of 0.2 msec. on and off is required, a silicon photodiode and amplifier may be substituted for the photoresistor. The model numbers for the high speed, isolated constant current generators are XA-313 and XA-313H.

The dimensions of the SS-13 are 8 1/8"W x 9"H x 12"D (in portable gray carrying case). All 313 units are mounted on a standard 5 1/4" x 19" gray rack panel.

Shipping weight is approximately 10 to 20 lbs, depending on model.

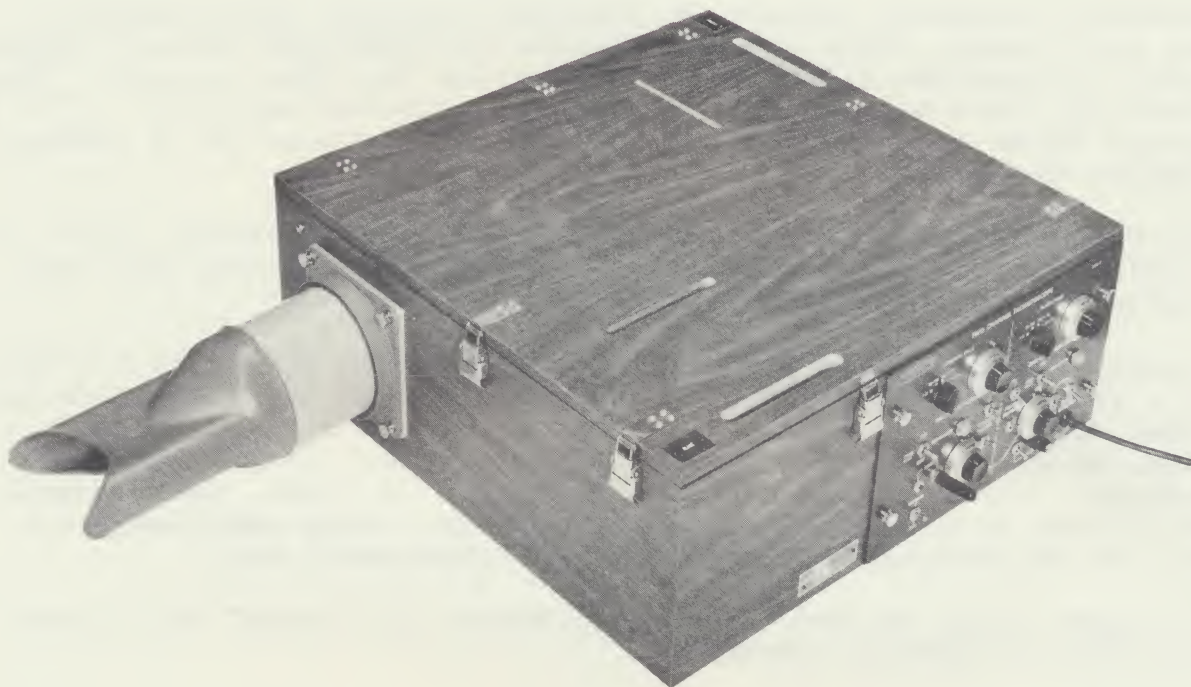
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TWO CHANNEL TACHISTOSCOPE MODEL 800-F



The 800-F two channel tachistoscope is the fastest, most flexible student tachistoscope available anywhere. Exposure time may be as short as 1 millisecond. The electronics are entirely silicon solid state for maximum reliability and negligible temperature sensitivity. The entire unit is completely free of routine maintenance except for periodic replacement of the field lamps. There are no vacuum tubes, relays, cams, or even germanium semi-conductors.

The logical structure of the unit consists of a pulse generator (operated by a front panel pushbutton or remote switch closure), which is used to start non-recurring events, plus two time interval generators, which cover 1 msec. to 11 sec. in 4 overlapping, direct reading ranges ( $\pm 2\%$ ). The time interval generators, which control the duration of the pulses for each



channel, have complete logical flexibility. They may be fired independently, simultaneously, or will recycle each other indefinitely. The "blank inhibit", "blank override" logic of the series E tachistoscopes is provided to permit the 800-F to operate either as a two channel tachistoscope or as a single channel unit with the second channel providing pre- and post-exposure adoption and/or fixation.

In addition to the normal mode of operation in which each timer controls the exposure duration of one of the fields, a separate "phi" mode is provided in which the stimulus timer controls the duration of both fields while the blank timer controls the inter-stimulus duration.

The two channel optical system has an adjustable mirror mount for alignment of the center of the fields and separate adjustments to permit matching of each edge of the field masks.

Electronic intensity control is provided covering approximately a 1 log unit range. This may be extended by inserting neutral density filters in separate filter holders provided for this purpose. These holders may also be used for transparent stimulus material. 4" x 5" stimulus cards are required and the viewing distance is 32 inches, including the hood.

Color match between the two fields is good, and intensity (max) is approximately 30 foot lamberts for a white card, making this unit suitable for color vision experiments.

A "Laboratory Manual in Vision" is provided with each unit to suggest a few experiments which can be performed if the tachistoscope is used for teaching purposes, such as: area and temporal summation, Broca-Sultzer phenomenon, figural after-effects, duration threshold, figure ground effects, detection of light, dark adaptation, visual acuity, and perceptual defense. Many additional effects may be studied including CFF, phi phenomena, etc.

Additional copies of the "Laboratory Manual in Vision" may be purchased from SCIENTIFIC PROTOTYPE.

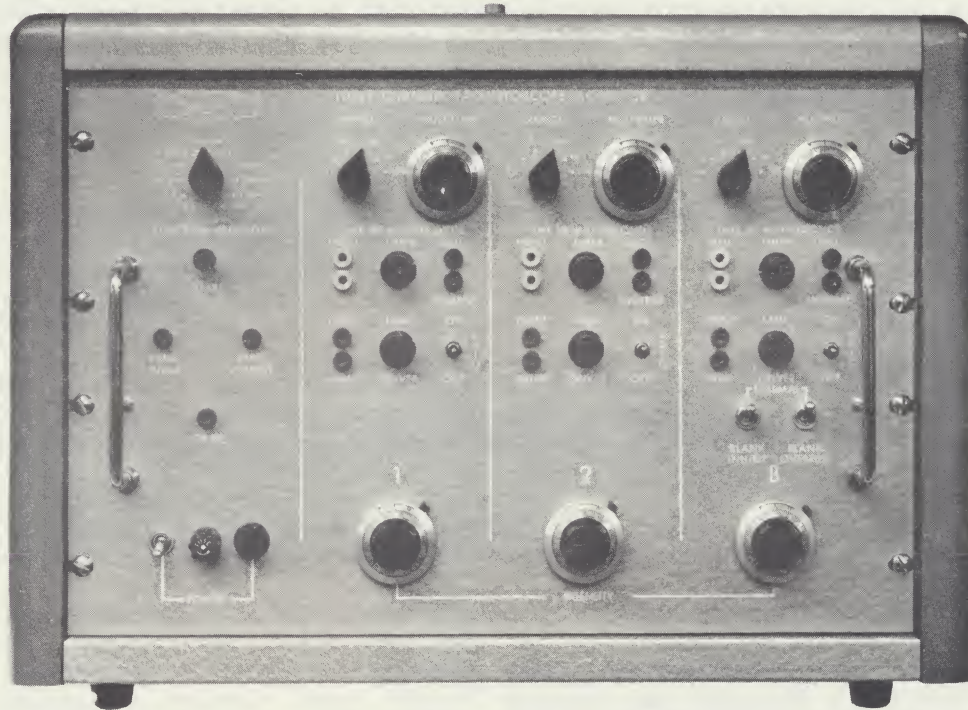
Shipping weight of the 800-F is approximately 115 lbs.







## THREE CHANNEL TACHISTOSCOPE, MODEL GB



The SCIENTIFIC PROTOTYPE three channel tachistoscope, Model GB, is the finest standard three channel tach available. This unit is the standard of comparison for tachistoscopes and is widely used in major laboratories throughout the world.

The three channel Dodge optical system contains three front surface mirrors: two combine the three channels; the third provides color correction. The two combining mirrors are provided with two axis pivoted mounts to permit exact centering of the fields. A separate mask with four independently adjustable edges is provided to mask each field and aid in the removal of visual cues. Two additional fully adjustable intermediate masks are provided to further reduce cues from box reflections.

5" x 7" stimulus cards, mounted in stainless steel holders, are manually inserted into each of the three fields on movable tracks which may be adjusted to equalize the apparent viewing distance of all three channels. A separate 5" x 7" filter holder is provided for each channel to permit the insertion of polaroid material, color filters or neutral density filters (to extend the range of intensity downward beyond the approximately 1 log unit range provided by the front panel intensity controls).



The filter holders may be used with transparent stimulus material, if a white card is inserted in the normal stimulus location, although higher brightness can be provided by using the normal stimulus position and auxilliary back illuminators.

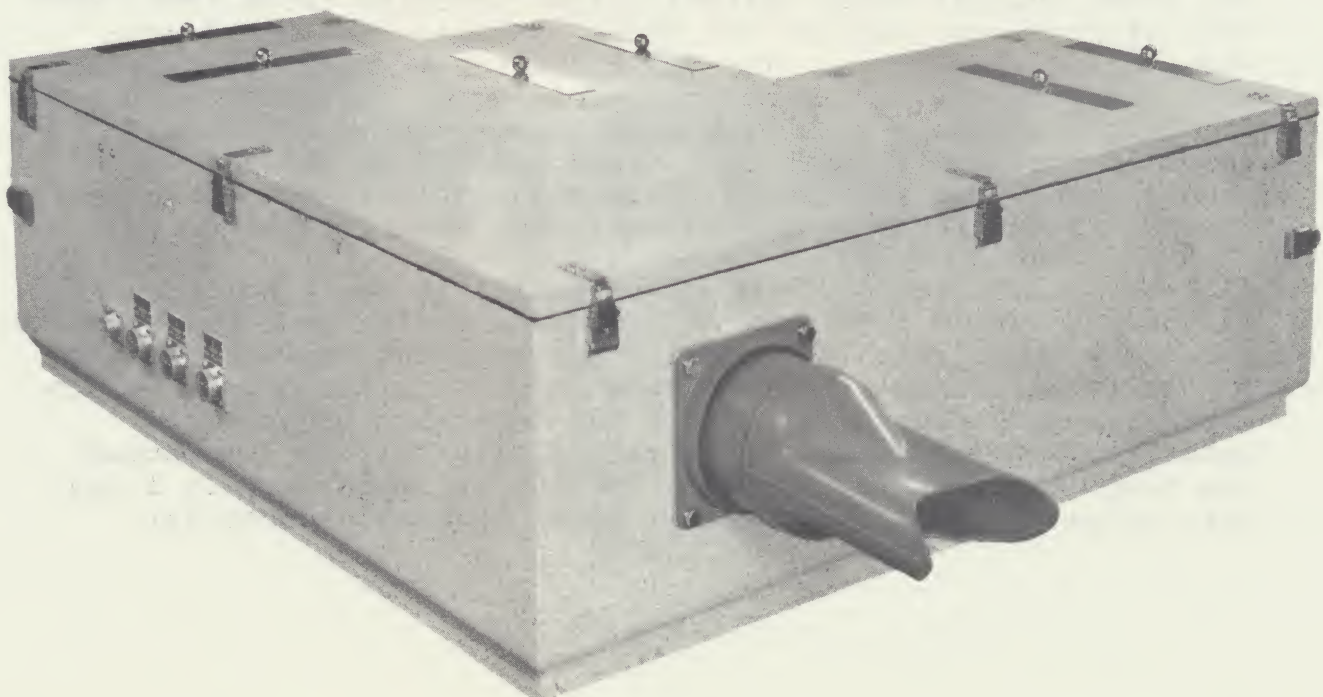
There are two lamps per field to provide uniform illumination (approximately 20 foot lambert maximum white card brightness - sufficient for color vision experiments). The rise and fall times are approximately 0.005msec and each lamp is provided with a separate precision constant current control system which employs a regulated reference supply. Ignition voltage is approximately 1000 VDC to provide rapid turn-on without using inductors, or capacitor trigger systems which limit the recycling rate. Control system compliance is over 600 VDC to eliminate changes in light output during thermal shifts which occur when a lamp is first ignited. A fitted viewing hood is provided to exclude ambient light.

The control unit provides three separate time interval generators covering 0.1msec to 110 sec in six overlapping, direct reading ranges with an accuracy of  $\pm 2\%$  of setting. Precision, ten turn lamp intensity controls are provided for each field. All logical inputs and outputs for both the timers and the lamp drivers are available at the front panel (including the lamp driver inhibit inputs). This permits patch-cord modifications of internally provided sequences (ten are provided), connection to external programming equipment (series G or H), and provides control signals to external measuring equipment, such as time interval counters.

A built-in pulse generator provides the input interface between a manual pushbutton or external contact closure and the internal logic.

The GB tachistoscope is entirely solid state with the exception of the six vacuum tubes which act as lamp switches. All logic, power supply regulation, timing and lamp current control is performed by semi-conductors derated far beyond "worst case" design criteria. All critical power supply voltages are regulated to eliminate the effect of line voltage variations on either lamp brightness, or exposure duration. Hermetically sealed power transformers, computer grade filter capacitors, solid slug tantalum and mylar/paper timing capacitors, even military connectors and knobs, provide unmatched reliability and stability.

Shipping weight is approximately 365 lbs.







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## THREE CHANNEL AUTO-TACHISTOSCOPE MODEL GB

## PRELIMINARY SPECIFICATIONS

The Model GB Auto-Tach consists of a standard three channel tachistoscope control system and a miniature three channel optical system which is designed for transillumination of 35mm transparencies. A beam splitter viewing head with adjustable interocular separation is provided.

Two of the three fields are provided with automatic stimulus changers which operate in approximately one second and locate the slide holders with a precision of 0.02 inches. The third field (i.e., "Blank") is ordinarily used for pre- or post-exposure adaptation or fixation and is equipped with a manual (drop-in) holder. Additional drop-in filter holders are provided in each channel.

The high brightness of transillumination systems and the high speed medium capacity changers (36 slide holder standard - 100 slide drum available which will not accept glass or precision slide mounts) make this the most convenient commercially available tachistoscope.

Technical Specifications:

- I- Optical System - 3 channel Dodge type
- |  |                               |
|--|-------------------------------|
| Viewing distance                                 | 16 inches                     |
| Apparent viewing distance (i.e., focal distance) | 30 feet                       |
| Field dimensions                                 | 1½" horizontal<br>1" vertical |
- Maximum clear field brightness 30 ft. lambert(min)
- Mirrors: 45/45 anti-reflection back coated
- Mirror mounts:
- A) "Beam Splitters" - two axes, gear driver (external access provided)
  - B) Color Corrector - fixed
- Diffusers: double etched mylar
- Masks:
- A) Reference Mask: fixed
  - B) Matching Mask: adjustable (all 4 edges independent)
- Viewing Head: Beam splitter, adjustable interocular separation
- Holders: 1 stimulus and 3 filter (35mm slide) plus 2 changers
- Viewing Axes: adjustable for interocular separation
- Electrical Connections: 3 separate field connections,  
1 interlock connection
- Material: black Bakelite
- Overall dimensions: approx. 2 ft. x 2 ft. x 1 ft.
- Weight: approx. 50 lbs.



II- Control System - 3 channel unit

A- Timers (3) solid state one-shot bootstrap reset

- 1- Range: 0.1 millise. to 110 sec (6 overlapping ranges)
- 2- Accuracy:  $\pm 2\%$  of reading
- 3- Inputs: 2 (A.C. coupled - independent)  
Outputs: 2 (gate & gate inverse - D.C. coupled)
- 4- Fan-out: 10 min.

B- Lamp drives (2 per channel) active series dissipative current feed-back type

- 1- Controls (1 per channel): 10-turn precision
- 2- Range: approx. 1 log unit
- 3- Accuracy (feed-back error):  $\pm 2\%$
- 4- Inputs: 2 normal input (D.C. coupled)  
inhibit input (D.C. coupled)

C- Pulse Generator - 1 per 3 channel control unit

30 cps rate limited go/no-go bounce filter  
for start pushbutton or external switch  
closure

D- General Construction - all solid state except for vacuum tube  
lamp switches

transformers hermetically sealed  
(Mil-T-27A) filter capacitors  
computer grade  
timing capacitors mylar/paper or solid  
electrolyte tantalum  
connectors aircraft (type K)  
hardware: military (Jan) & industrial

III- Stimulus Changers

Capacity - 36 or 100 (TDC type tray)

Speed - 1 sec/cycle max

Controls - Input (Direct Coupled with manual pushbutton)  
Input (A.C.)  
Inhibit input (Direct Coupled with manual pushbutton)  
Reverse input (Direct Coupled with manual pushbutton)  
End of file report output (D.C.)

Display - Manually reset electromechanical frame counter

Shipping weight of control system and stimulus changers is  
approximately 200 lbs.

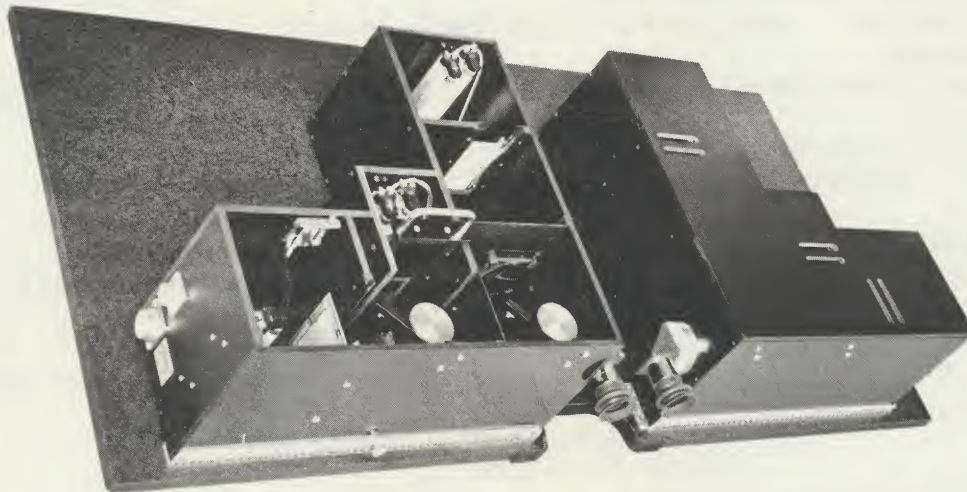
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SIX CHANNEL BINOCULAR TACHISTOSCOPE MODEL GB



The optical system shown above - plus two standard model GB three channel electronic control systems (not shown) make up the first standard binocular tachistoscope to be placed in regular production.

The new unit utilizes 35 mm standard transparencies and provides a maximum clear field brightness of approximately 50 foot lamberts, which makes the system ideal for color vision experiments. Internal lenses adjust the apparent viewing distance to approximately 30 feet, which is well within the comfortable focusing range of the majority of the population. A 7/8 inch aperture at the viewing heads makes eye position relatively non critical. Independent interocular angle and separation adjustments, externally adjustable mirror positioning, and only a single adjustable framing mask make this the most convenient binocular tachistoscope available.

All of the superb performance characteristics of the three channel GB tachistoscopes have been retained, from magnesium fluoride anti-reflection backing on the mirrors to precision multiturn lamp intensity controls. The logical flexibility has been greatly enhanced by the new sequences which can be generated by interconnecting the six time interval generators and six lamp drivers provided in the dual control systems.

A wide variety of accessories and modifications is available to further enhance the versatility of this remarkable instrument.



## TECHNICAL SPECIFICATIONS

- I- Optical System - twin 3 channel Dodge type
- Viewing distance 15 inches
  - Apparent viewing distance (i.e. focal distance) 30 feet
  - Field dimensions 1½" horizontal  
1" vertical
  - Maximum clear field brightness 50 ft. lambert (min)
  - Mirrors: 45/45 anti-reflection back coated
  - Mirror mounts:
    - A) "Beam Splitters" - two axes, gear driver (external access provided)
    - B) Color Corrector - fixed
  - Diffusers: double etched mylar
  - Masks:
    - A) Reference Mask: fixed
    - B) Matching Mask: adjustable (all 4 edges independent)
  - Viewing head: 90° with 7/8" clear aperture
  - Holders: 6 stimulus and 6 filter (35 mm slide)
  - Viewing axes: adjustable for interocular separation and angle
  - Electrical connections: 6 separate field connections,  
2 interlock connections
  - Material: black Bakelite
  - Overall dimensions: approx. 4 ft. x 2 ft. x 1 ft.
  - Weight: approx. 50 lbs.
- II- Control System - dual independent 3 channel units
- A- Timers (3 x 2 = 6 total) solid state one-shot bootstrap reset
    - 1- Range: 0.1 millisec. to 110 sec (6 overlapping)
    - 2- Accuracy: ±2% of reading
    - 3- Inputs: 2 (A.C. coupled - independent)
    - Outputs: 2 (gate & gate inverse - D.C. coupled)
    - 4- Fan-out: 10 min.
  - B- Lamp drives (2 per channel) active series dissipative current feed-back type
    - 1- Controls (1 per channel): 10 turn precision
    - 2- Range: approx. 1 log unit
    - 3- Accuracy (feed-back error): ±2%
    - 4- Inputs: 2- normal input (D.C. coupled)  
inhibit input (D.C. coupled)
  - C- Pulse generator - 1 per 3 channel control unit  
30 cps rate limited go/no-go bounce filter for start pushbutton or external switch closure
  - D- General construction - all solid state except for vacuum tube lamp switches  
transformers hermetically sealed  
(Mil-T-27A) filter capacitors  
computer grade  
timing capacitors mylar/paper or solid electrolyte tantalum  
connectors aircraft (type k)  
hardware: military (Jan) and industrial

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MULTIPLE-CIRCUIT MERCURY COMMUTATOR MODEL MC4



This commutator eliminates the need to interrupt an experiment to untwist wires from a moving animal. As the animal moves around its cage, the merest torque exerted by the wires turns the rotor so the wires never twist. Even the most flexible wire (hearing aid or phono-pickup wire) easily turns the rotor.

The commutator's rotor shaft is mounted vertically in two ultra-precision, maintenance-free, ball bearings of beryllium-copper, an exceptionally hard alloy. Wires from the animal pass to a convenient plug mounted on the rotor shaft, then up through the hollow shaft and out to platinum-iridium whiskers which dip into concentric, donut-shaped pools of mercury. The mercury maintains



continuous electrical contact as the animal and rotor turn. Electrical current passes through the mercury to contacts in the bottom of each pool, then to universal banana jacks.

An animal may be left, unattended for days at a time, without twisting its wires. Extensive tests and refinements have been carried out on this commutator during research involving electrical stimulation of the brain. The commutator was proven completely effective.

The basic commutator has four channels. Any number of channels, in multiples of four, can be provided. Modifications can be made for special applications.

#### Specifications:

Electrical resistance: less than 0.1 ohm; negligible.

Dimensions: 3" x 6" block with universal jacks protruding up 1" and the rotor shaft with a female Jones plug extending down 4".

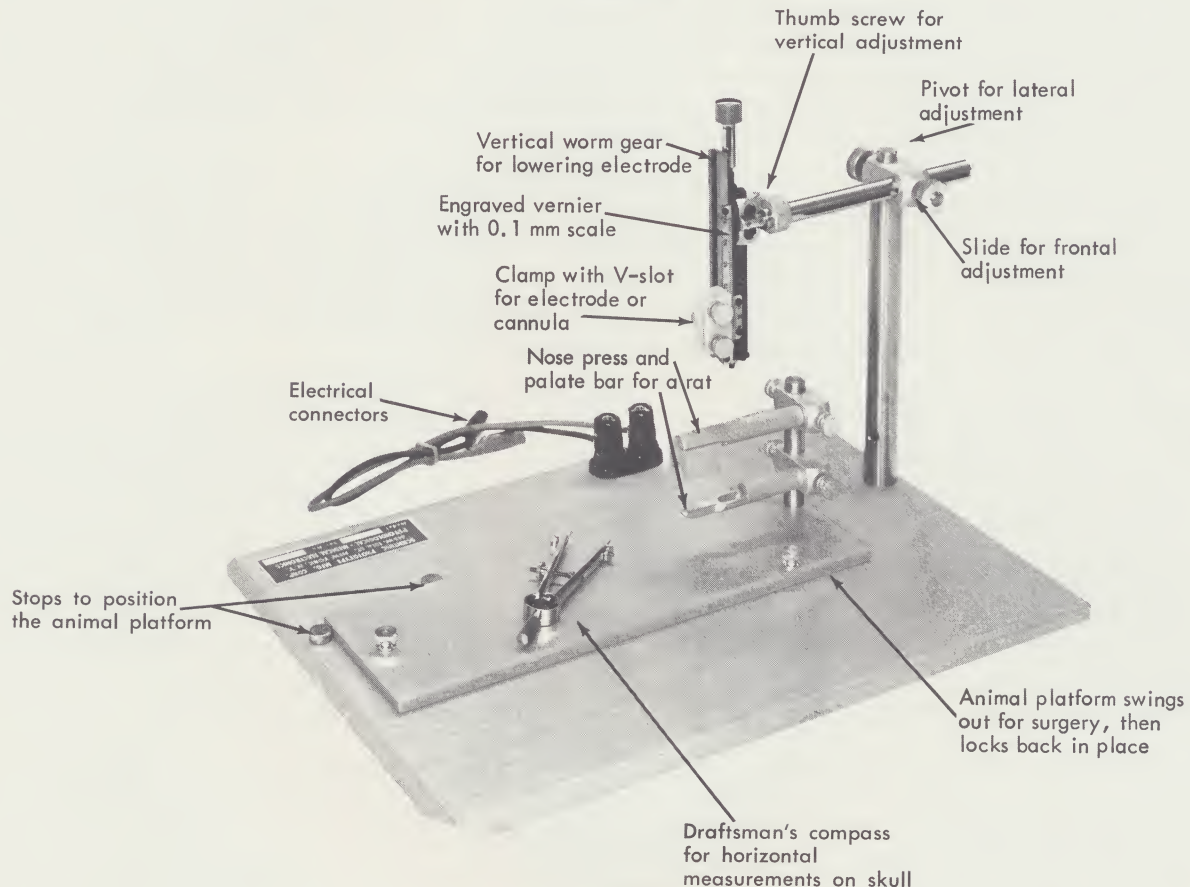
#### Special features:

- 1) Platinum-Iridium Contacts: proven superior to all other metals tested for maintaining constant electrical properties.
- 2) Recessed Channels: the mercury wells and rotor are recessed to prevent mercury spillage and make a compact unit.
- 3) Dustproof Construction: recessed wells and rotor are further protected by a removable cap.
- 4) Easy Maintenance: to fill the mercury wells the cap is removed and the entire rotor and shaft unit slides up through the ball bearings to provide easy access to the wells.



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## STUDENT STEREOTAXIC INSTRUMENT MODEL S

STUDENT STEREOTAXIC INSTRUMENT  
MODEL S

Model S is the simplest stereotaxic instrument. It is designed for use in student laboratories. The instruction manual tells how to implant electrodes and stimulate the brain. In brief, clamp the rat's head (this is easy because there are no ear bars), and mark horizontal measurements on the rat's skull with a draftsman's compass by using skull sutures as reference points. Then, position an electrode over the mark and lock it there. Swing out the animal platform; drill a hole at the mark, and return the platform to its original position. The calibrated worm gear lowers the electrode into the brain. The instrument has already been proven successful in undergraduate laboratory classes in psychology and biology.

Specifications:

**Vertical Movement:** The electrode can be raised and lowered 5 cm. by a worm gear with an anti-backlash feature and tension adjustment. The carriage can be tilted sideways and then



locked with a thumb screw. This is useful for angular approaches to the brain, although it is primarily intended to allow rapid setting to vertical.

Verniers: Sharp black lines are cut in a silver background for excellent legibility. Calibration is in tenths of a millimeter.

Horizontal Movement: The horizontal arm slides forward and back. A large, thumb screw locks into a V-slot to hold the arm where desired. The horizontal arm swings from side to side on a collar milled in the upright post. A large, thumb screw locks it in position. A 3 inch, precision compass is provided for making horizontal measurements directly on the rat's skull.

Electrode Holder: A nylon block has a milled V-slot. The cover clamps down with two thumb screws. The block can be tilted to compensate for a bent electrode. The electrode holder is attached to the vertical carriage by a clutch device which can be locked at any height to make room for a collet or any other special electrode adapter.

Animal Platform: The platform is held by two thumb screws. After removing the front screw, the platform swings out from under the stereotaxic movements for scalp incision and skull drilling. The platform swings back into place and always locks in exactly the same position against three stainless steel stops. By removing both thumb screws, the platform can easily be taken off for use as a separate dissecting stage. This is particularly convenient for cementing attachments to the skull; for example, thermister wires, swivel joints, or cannula outlets. The complete animal platform with head fittings can be purchased separately.

Head Fittings: This bar fits against the molars and top of the mouth. It holds the animal's palate level, which also makes the skull approximately level. The nose press is a contoured fitting that presses the animal's snout against the palate bar. Appropriate stereotaxic atlases are listed in the instructions.

Electrical Connectors: Universal banana jacks receive leads from any lesion device. Wires with insulated midget clips are also provided for attachment to electrodes.

Maintenance: All parts are individually replaceable. All can be machined. Nothing can rust.

Economical Design: The design of this stereotaxic instrument incorporates maximum simplicity and durability with economy for application in student laboratory classes.

Quality Control: Before shipment, stereotaxic instruments are individually aligned, inspected, and approved.

Shipping weight is approximately 10 lbs.

Distributed by

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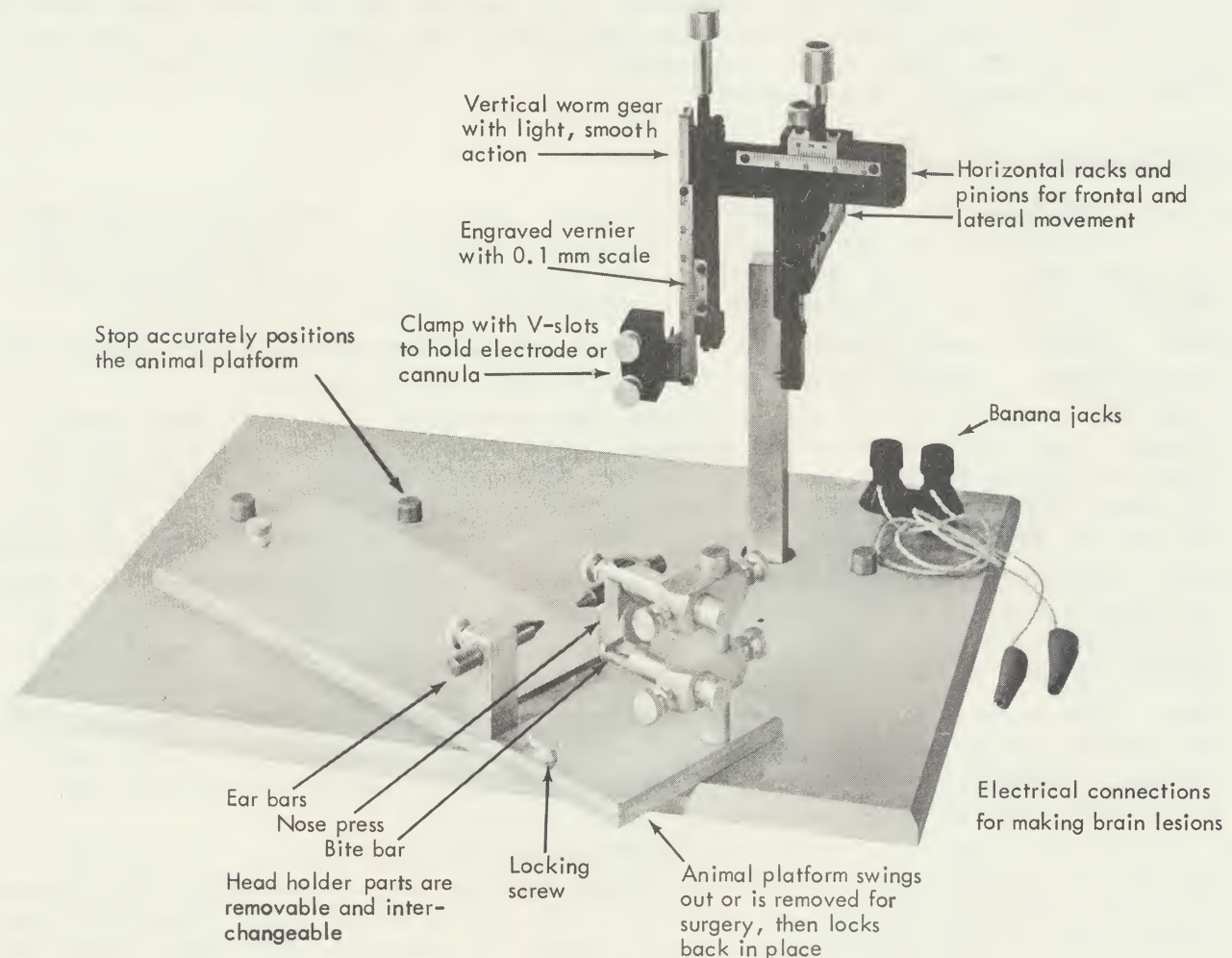


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Manufactured by  
Brain Research Instruments Co.

RIGHT ANGLE STEREOTAXIC INSTRUMENT "BRAINPROBE" MODEL B

RIGHT ANGLE STEREOTAXIC INSTRUMENT  
"BRAINPROBE" MODEL B



The main advantage of the Model B is its rugged simplicity. This simplicity has repeatedly proven to minimize placement error in the most delicate and exacting operations. The stereotaxic movements are mounted at right angles over the animal's head. The precision gears and sliding surfaces within these movements provide unusually smooth, sensitive adjustment. The vernier scales are calibrated in tenths of a millimeter and are exceptionally easy to read. The animal holder swings out from under the stereotaxic assembly to provide access for surgery, or it can be completely removed from the instrument for use as a separate dissecting stage.

The head fittings are removable and made of standard size materials so that a scientist can adapt the instrument to meet his special



experimental needs. The head fittings supplied with the instrument are shaped for the rat; researchers have also adapted fittings to the mouse, hamster, pidgeon, chick, snake, and cockroach. The nose clamp can be adjusted to position an animal's head in accordance with the coordinate system in any stereotaxic atlas.

Other advantages include a nylon electrode holder with a V-slot that holds any common electrode, cannula, electrode adapter, pin vise, or miniature chuck. The electrode holder can be positioned at any height or removed. All parts are individually replaceable; all parts can be machined; nothing can rust. Electrical connections are provided for making brain lesions. The price is low so that each researcher in a laboratory can have his own, individual stereotaxic instrument.

#### Specifications:

**Stereotaxic Movements:** Horizontal movement is 3 cm. front-to-back and 3 cm. side-to-side by rack and pinion. Vertical movement is 5 cm. by worm gear with an anti-backlash feature and tension adjustment. Thumb screws can be removed for attaching remote drive cables.

**Verniers:** Sharp black lines are cut in a silver background for excellent legibility. Calibration is in tenths of a millimeter.

**Electrode Holder:** A black nylon block has a milled V-slot. The cover clamps down with two thumb screws. The block can be tilted to compensate for a bent electrode. The electrode holder is attached to the vertical carriage by a clutch device which can be locked at any height to make room for a collet or any other special electrode adapter.

**Ear Bars:** Matched ear bars slide in and out freely to transmit the "feel" of bone structure in the auditory meatus. Ear bars lock firmly in place with thumb screws. Ear bar posts are machined as a pair to assure exact alignment.

**Nose Bar:** The bite bar and nose press are independently adjustable in the anterior-posterior direction as well as vertically. They are easily removed, interchanged, and inverted to mount an animal upside-down for dissection.

**Animal Platform:** The platform is held by two thumb screws. After removing the front screw, the platform swings out from under the stereotaxic movements for scalp incision and skull drilling. The platform swings back into place and always locks in exactly the same position against three stainless steel stops. By removing both thumb screws, the platform can easily be taken off for use as a separate dissecting stage. This is particularly convenient for cementing attachments to the skull; for example, thermister wires, swivel joints, or cannula outlets. The complete animal platform with head fittings can be purchased separately.

**Electrical Connections:** Universal banana jacks receive leads from any lesion device. Wires with insulated midget clips are provided for attachment to electrodes.

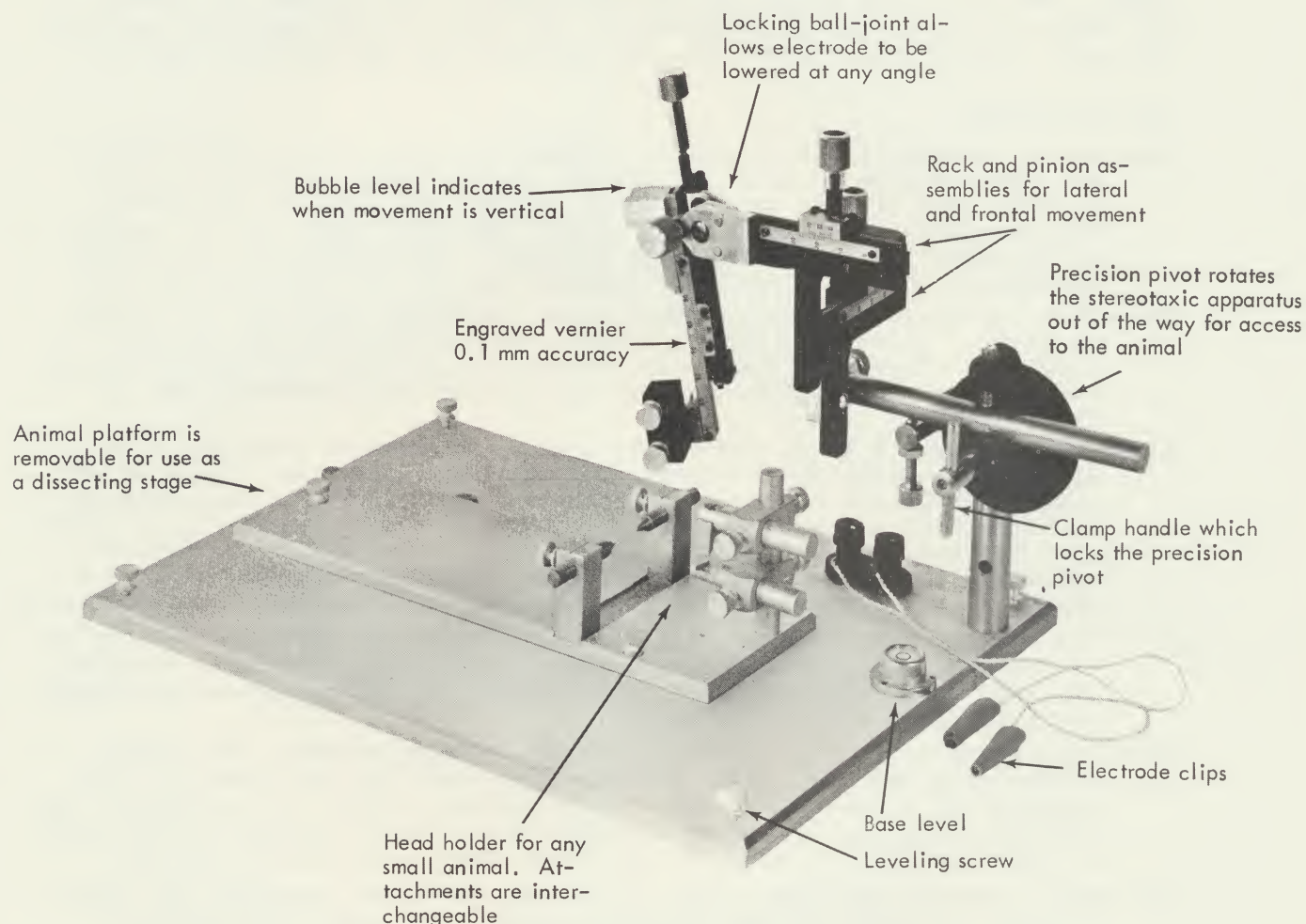
**Quality Control:** Before shipment, stereotaxic instruments are individually aligned, inspected, and approved.

Shipping weight is approximately 12 lbs.





FLIP BACK STEREOTAXIC INSTRUMENT MODEL F  
FLIP BACK STEREOTAXIC INSTRUMENT  
MODEL F



This is the Model B with two additional features. A locking ball joint allows an electrode to be lowered at any angle. Angles off of vertical are not calibrated, but the vertical position is shown by bubble levels. To provide rapid access to the animal, the entire stereotaxic assembly pivots up and out of the way. This provides a completely unobstructed field for handling and viewing the animal. The pivot is released or clamped by a turn of a single, convenient handle. Large bearing surfaces and a stop insure that the assembly comes home to rest in the same position every time.

The stereotaxic movements have precision gears and sliding surfaces which provide unusually smooth, sensitive adjustment. The vernier scales are calibrated in tenths of a millimeter and are exceptionally



easy to read. The animal holder swings out from under the stereotaxic assembly to provide access for surgery, or it can be completely removed from the instrument for use as a separate dissecting stage.

The head fittings are removable and made of standard size materials so that a scientist can adapt the instrument to meet his special experimental needs. The head fittings supplied with the instrument are shaped for the rat; researchers have also adapted fittings to the mouse, hamster, pidgeon, chick, snake, and cockroach. The nose clamp can be adjusted to position an animal's head in accordance with the coordinate system in any stereotaxic atlas.

Other advantages include a nylon electrode holder with a V-slot that holds any common electrode, cannula, electrode adapter, pin vise, or miniature chuck. The electrode holder can be positioned at any height or removed. All parts are individually replaceable; all parts can be machined; nothing can rust. Electrical connections are provided for making brain lesions.

#### Specifications:

**Stereotaxic Movements:** Horizontal movement is 3 cm. front-to-back and 3 cm. side-to-side by rack and pinion. Up and down movement is 5 cm. by worm gear with an anti-backlash feature and tension adjustment. This movement pivots on a ball joint. The ball joint can be locked in any position 30 degrees from vertical. The joint also can swing forward at any angle up to 90 degrees for use as a micromanipulator.

**Leveling:** A two-dimensional, bubble level indicates when the base plate is level. There is a similar bubble level mounted on the up-down carriage. When this bubble is in the same position as the base-plate bubble then the up-down carriage is vertical and perpendicular to the base.

**Flipback Feature:** A large pivot with a polished bearing surface, 2"O.D., allows the entire three-dimensional carriage system to rotate up and completely out of the way. The front-to-back rack and pinion has a locking thumb screw to prevent any slippage when the assembly is swung up. The assembly is brought back to rest in its original position against a set screw. The set screw is adjustable and locking. A T-shaped handle clamps the bearing surfaces together with a single twist. For cutting the scalp and drilling the skull, the user has the choice of pivoting the assembly up and away or swinging the animal platform out from under the assembly. Extra animal platforms can be purchased for production-line implantation.

**Electrode Holder:** A black nylon block has a milled V-slot. The cover clamps down with two thumb screws. The block can be tilted to compensate for a bent electrode. The electrode holder is attached to the vertical carriage by a clutch device which can be locked at any height to make room for a collet or any other special electrode adapter.

**Ear Bars:** Matched ear bars slide in and out freely to transmit the "feel" of bone structure in the auditory meatus. Ear bars lock firmly in place with thumb screws. Ear bar posts are machined as a pair to assure exact alignment.

**Nose Bar:** The bite bar and nose press are independently adjustable in the anterior-posterior direction as well as vertically. They are easily removed, interchanged, and inverted to mount an animal upside-down for dissection.

**Animal Platform:** The platform is held by two thumb screws. After removing the front screw the platform swings out from under the stereotaxic movements for scalp incision and skull drilling. The platform swings back into place and always locks in exactly the same position against three stainless steel stops. By removing both thumb screws, the platform can easily be taken off for use as a separate dissecting stage. This is particularly convenient for cementing attachments to the skull; for example, thermister wires, swivel joints, or cannula outlets.

**Electrical Connections:** Universal banana jacks receive leads from any lesion device. Wires with insulated midget clips are provided for attachment to electrodes.

**Quality Control:** Before shipment, stereotaxic instruments are individually aligned, inspected, and approved.

Shipping weight is approximately 14 lbs.



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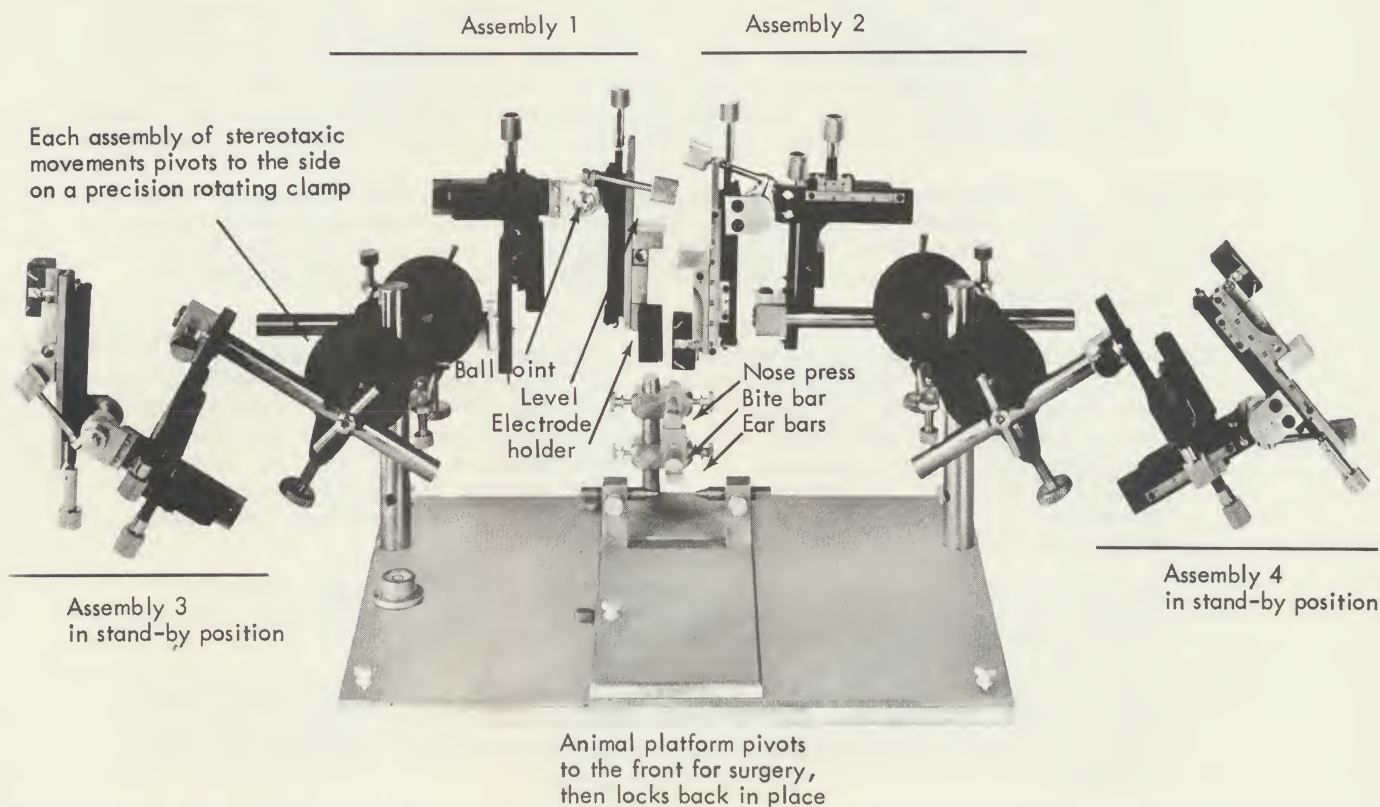


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Manufactured by  
Brain Research Instruments Co.

### QUADRUPLER STEREOTAXIC INSTRUMENT MODEL Q

#### QUADRUPLER STEREOTAXIC INSTRUMENT MODEL Q



This is Model F with four independent stereotaxic assemblies instead of one. The instrument can be used for multiple implantation of brain electrodes, simultaneous stimulation and recording, EEG experiments, with independent stereotaxic control of each electrode, or micromanipulation with one, two, three, or four probes.

Locking ball joints allow the electrodes to be lowered at any angle. Angles off of vertical are not calibrated, but the vertical position is shown by bubble levels. To provide rapid access to the animal, each stereotaxic assembly can pivot up and out to a stand-by position as shown in the photo. A pivot is released or clamped by a turn of a convenient handle. Large bearing surfaces and a stop insure that the assembly comes home to rest in the same position every time.

The stereotaxic movements have precision gears and sliding surfaces which provide unusually smooth, sensitive adjustment. The vernier scales are contrasting black on silver for legibility. The animal platform swings to the front of the base plate to give



access to the animal without moving the stereotaxic assemblies. The animal platform can also be completely removed for special applications.

The head fittings are readily adjustable, removable, and interchangeable. The instrument is supplied with fittings for the rat; other animals can be accommodated.

#### Specifications:

**Stereotaxic Movements:** Each assembly has the following characteristics: horizontal movement is 3 cm. front-to-back and 3 cm. side-to-side by rack and pinion. Up and down movement is 5 cm. by worm gear with an anti-backlash feature and tension adjustment. This movement pivots on a ball joint. The ball joint can be locked in any position 30 degrees from vertical. The joint also can swing forward at any angle up to 90 degrees for use as a micromanipulator. The thumb screws for locking the ball joints are positioned so they will clear one another when the four assemblies are in their closest positions.

**Leveling:** A two-dimensional bubble level indicates when the base plate is level. There is a similar bubble level mounted on the up-down carriage. When this bubble is in the same position as the base plate bubble then the up-down carriage is vertical and perpendicular to the base.

**Flipback Feature:** A large pivot with a polished bearing surface, 2 " O.D., allows the entire 3 dimensional carriage system to rotate up and completely out of the way. The front-to-back rack and pinion has a locking thumb screw to prevent any slippage when the assembly is swung up. The assembly is brought back to rest in its original position against a set screw. The set screw is adjustable and locking. A T-shaped handle clamps the bearing surfaces together with a single twist.

For cutting the scalp and drilling the skull, the user has the choice of pivoting the assemblies up and away or swinging the animal platform out from under the assembly.

**Electrode Holders:** Each electrode is clamped in a 13 gauge stainless steel tube mounted on the corner edge of a nylon block. This allows all four electrodes to be moved immediately adjacent to one another.

**Ear Bars:** Matched ear bars slide in and out freely to transmit the "feel" of bone structure in the auditory meatus. Ear bars lock firmly in place with thumb screws. Ear bar posts are machined as a pair to assure exact alignment.

**Nose Bar:** The bite bar and nose press are independently adjustable in the anterior-posterior direction as well as vertically. They are easily removed, interchanged, and inverted to mount an animal upside-down for dissection.

**Animal Platform:** The platform is held by two thumb screws. After removing the front screw the platform swings out from under the stereotaxic movements for scalp incision and skull drilling. The platform swings back into place and always locks in exactly the same position against three stainless steel stops. By removing both thumb screws the platform can easily be taken off for use as a separate dissecting stage. This is particularly convenient for cementing attachments to the skull; for example, thermister wires, swivel joints, or cannula outlets. The complete animal platform with head fittings can be purchased separately.

**Quality Control:** Before shipment, stereotaxic instruments are individually aligned, inspected, and approved.

Shipping weight is approximately 18 lbs.

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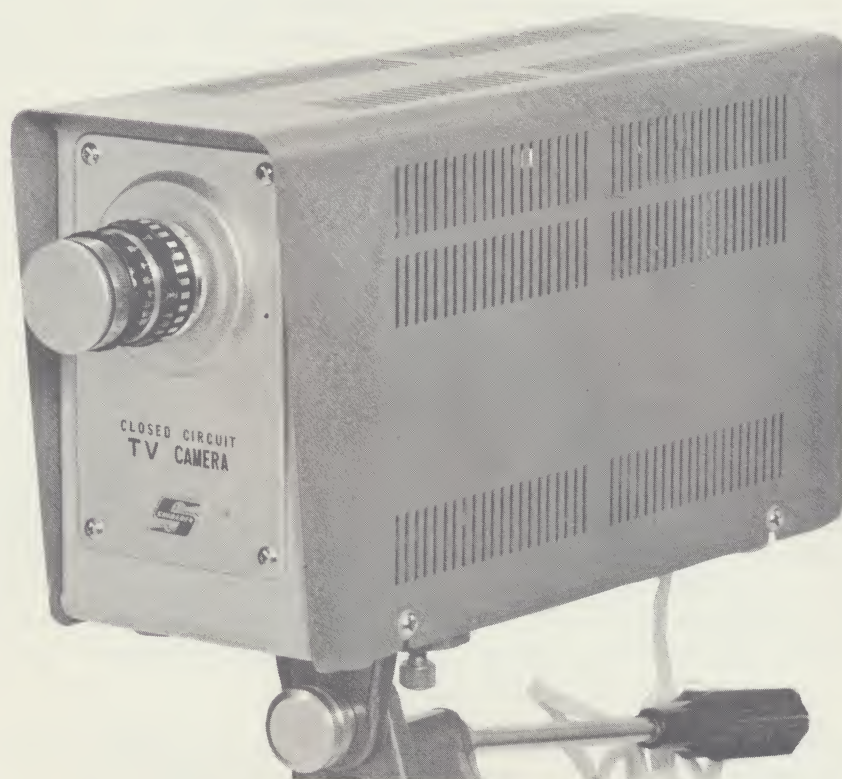
#### SEPARATE DISSECTING STAGE MODEL SDS

The animal holder which comes with stereotaxic instruments Models B, F, Q, and S is available for purchase as a separate item.

An animal, such as the rat, can be firmly mounted in this device with the animal's head held dorsal or ventral side up (for cranial, spinal, gastric, or thoracic surgery). Here are a few procedures in which the Separate Dissecting Stage has already proved useful: gastric fistulation, cementing thermister wires to the skull, oral surgery, nerve-muscle preparations, spinal dissection, and cardiac cannulation.

Because all parts of the Separate Dissecting Stage are made of solid, marine-grade aluminum or stainless steel, the investigator can drill holes in the platform to add special attachments he has made for particular experiments. The device is simple, rugged, versatile, and adaptable. It is always immediately available from stock.



**CLOSED CIRCUIT T.V. CAMERA MODEL HV-14**

The imported Model HV-14 closed circuit T.V. Camera is compact and completely self-contained. It provides two types of output, Video and RF, which can be used simultaneously or independently. The video output is connected to a video monitor. The RF output is connected to the antenna input of a "home type" commercial TV set through an impedance-matching unit. The standard lens is an f1.4 25mm, C-Mount unit and is interchangeable with other common lenses (most 16mm lenses, Tele-photo, wide angle, Zoom, etc.).

There are two focusing controls: the normal lens focusing ring, and a second which adjusts the vidicon tube with respect to the lens by means of a rear control knob. These two methods of focusing make it possible to get fine focus adjustments and also permit extreme close-ups of relatively flat small objects.

The HV-14 is a standard SCIENTIFIC PROTOTYPE closed circuit T.V. Camera; a variety of cameras is available for special applications.

- HV-14      --    Self-contained; 7735A Vidicon; 25mm f1.4 lens; matching impedance transformer; 15' coaxial cable, with connectors.
- HV-50      --    Viewfinder camera head with camera control unit; HS-202 Vidicon; 25mm f1.9 lens.
- HV-24      --    Miniature high resolution film chain camera. Camera head with camera control unit; HS-200 Vidicon; 25mm f1.4 lens; 33' camera cable; 33' coaxial cable with connectors; 6' drive cable; E.I.A. Synch.
- FB-107-1B --    High resolution studio camera. Viewfinder camera head with camera control unit; HS-200 Vidicon; 20/100mm f1.8 Zoom lens; 2 telephone headsets; 50' camera cable; 50' coaxial cable, with connectors.

#### Specifications of the HV-14:

The HV-14 Camera is entirely solid state with the exception of the Vidicon Tube. Horizontal Frequency (nominal): 15,750cps. Vertical Frequency (synchronized to power line frequency): 60cps. Scanning Lines (random interlace): 525 lines. Output: Video Output Voltage Composite 1.4V p-p/75 ohm min. RF Output Voltage 25 mV/75 ohm min. at a frequency tunable from channel #2 through channel #6.

Operating Requirements: Illumination, 30 ft.-c min.; Automatic Light Compensation, 300 to 1; Ambient Temperature, 32 to 104°F; Lens Mount, Std. 16mm, type "C"; Base Mount, Screw, 1/4"-20 thd.

#### Max. Cable Length:

Video: 1000' using RG59/U cable; 2000' using RG11/U cable;  
RF: 450' using RG59/U cable; 800' using RG11/U cable.

Power Requirement: 117VAC single phase, 60cps, 15 Watts;  
Dimensions and Weight: 3 7/8"W x 6 1/2"H x 11 1/4"D; 7 lbs.  
(without lens and cable).

The HV-14 T.V. Camera is supplied complete with a fast f1.4 25mm lens, a 15' cable, and an impedance-matching transformer for use with any conventional T.V. set. A full range of accessory lenses and equipment is available.

Shipping weight of the HV-14 is approximately 20 lbs.



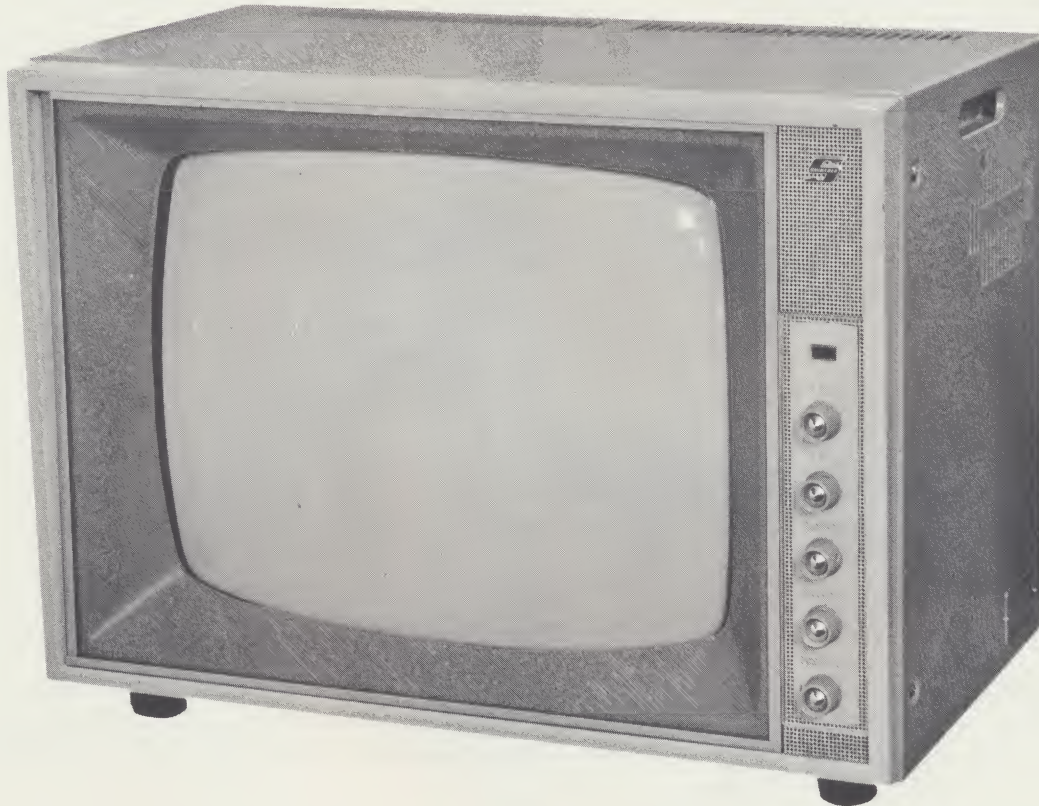
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615 W. 131 STREET, NEW YORK, N.Y. 10027

HEAVY DUTY 16" VIDEO MONITOR MODEL VM-163



The VM-163 is a general purpose video monitor designed for research application. The VM-163 presents a clear bright picture.

Video response is flat to 5 megacycles assuring a horizontal resolution of 400 lines.

The deflection circuits produce both horizontal and vertical linearities within 5% of picture height. The kinescope employed is of modern wide angle electrostatic focus type. The spot size and shape are considerably improved over other units. Smaller spot size gives vastly improved resolution over the entire screen.

The construction is hand-wired. Top quality components are used throughout. The cabinet is constructed of heavy gauge steel, finished in Melamin. A speaker with a volume control for audio systems use is provided.

The VM-163 is the standard SCIENTIFIC PROTOTYPE video monitor but a complete line is available for special requirements.

- Model VM-501A -- 5", with mini-size, plug-in circuit boards, for high quality, CCTV and Broadcast TV studio use; three 5" Monitors mount on a 19" panel.
- Model VM-901 -- 9" high quality, heavy duty.
- Model VM-902A -- 9" for Broadcast and Studio use; two units can be mounted on a standard 19" panel.
- Model VM-163 -- 16", with audio input jack; speaker; high quality monitor - heavy duty; general purpose.
- Model VM-231 -- 23", with audio input jack; speaker; high quality monitor - heavy duty; group display.
- Model TU-9UM -- 9" RF-Video Receiver-monitor; a CCTV all-purpose utility Monitor.

#### Technical Specifications for VM-163:

Input Power: 110/117 volts, 50/60 cycles, 140 VA.

Video Signal: 0.25 volt, p-p (minimum for 50 volts at kinescope); 2.0 volts maximum, sync. negative.

Video Input: High impedance bridging (1 M $\Omega$  in parallel with 20 mmfd.). Parallel coax input connectors for multiple operation and a line terminating resistor and switch are provided.

Video Response: 5 Mc  $\pm$ 1 db. (400 line resolution). Differential gain below 5% at 50 volt kinescope drive.

Linearity: Within 5% of picture height.

Audio Input: 2500 ohm, phono jack.

Speaker: Size 3" x 5", output 2 watts (permanent magnet type).

High Tension Voltage: 15 KV.

Front Panel Controls: On-off switch and volume, brightness contrast, horizontal hold, vertical hold, pilot light.

Rear Apron Connectors: AC cord 9' long, fuse, audio input jack, paralleled video input connectors, video input connectors, video terminating switch, vertical linearity "1", height, vertical linearity "2", width, horizontal linearity.

Shipping weight of the VM-163 is approximately 75 lbs.



# SCIENTIFIC PROTOTYPE MFG. CORP.

615 W. 131 STREET, NEW YORK, N.Y. 10027



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368-6000

## GENERAL EQUIPMENT PRICE LIST

EFFECTIVE SEPTEMBER 1ST, 1966

<u>Cat. No.</u>	<u>Description</u>	<u>Price</u>
25	Operant Conditioning Kit	\$ 40.00
A-100	Rodent Test Cage (unless specified, #51 end panel supplied)	40.00
A-101A	Rodent Test Cage	155.00
A-106	Rodent Test Cage wo/feeder	172.00
A-106/D-700	Rodent Test Cage w/feeder	259.00
A-106/L-11	Rodent Test Cage w/solenoid valve dispenser	259.00
A-106/L-22	Rodent Test Cage w/liquid dipper	269.00
MS	Manual Scrambler Option	30.00 add'l
AS	Automatic Solid State Scrambler Option	100.00 add'l
A-110	Rodent Test Chamber wo/feeder	217.00
A-110/D-700	Rodent Test Chamber w/feeder	305.00
A-110/L-11	Rodent Test Chamber w/solenoid valve disp.	305.00
A-110/L-22	Rodent Test Chamber w/liquid dipper	315.00
MS	Manual Scrambler Option	30.00 add'l
AS	Automatic Solid State Scrambler Option	100.00 add'l
A-115	Rodent Test Chamber wo/feeder	358.00
A-115/D-700	Rodent Test Chamber w/feeder	445.00
A-115/L-11	Rodent Test Chamber w/solenoid valve disp.	445.00
A-115/L-22	Rodent Test Chamber w/liquid dipper	455.00
RL-200	Retractable Pedal Lever	115.00
PLS-200	Pedal Lever	24.00
D-700	Automatic Pellet Dispenser	83.00
D-701	Automatic Pellet Dispenser	85.00
D-702	Automatic Pellet Dispenser	85.00
P/D-3/1	Program Disc for D-700	4.00
P/D-11/1	Program Disc for D-700	4.00
P/D-33/1	Program Disc for D-700	4.00
P/D-R	Program Disc for D-700	4.00
P/D-4-	Program Discs for D-700 - set of 4, specify	15.00
L-11	Solenoid Valve Liquid Dispenser	85.00
L-22	Liquid Dipper	95.00
50	Cage End Panel for A-100 Series	4.00
51	Cage End Panel for A-100 Series	6.00
52	Cage End Panel for A-100 Series	6.00
53	Cage End Panel for A-100 Series	6.00
54	Cage End Panel for A-100 Series	6.00
50-S	Cage End Panel for A-100 Series	P.U.R.

WB	Water Bottle	2.50	
FT	Food Tray	4.00	
CL	Cue Light (mounted)	6.00	
B-200	Pidgeon Test Chamber	95.00	
K-100	Standard Pecking Key	25.00	
K-200	Bounceless Pecking Key	45.00	
L-100	Three Color Back-Illuminators	20.00	
SPC-300	Sound-Proof Chamber	225.00	
	Peep Hole	20.00	add'l
	Viewing Window (installed)	45.00	add'l
	8 ohm Speaker (installed)	10.00	add'l
4026-J	Reg. Power Supply, 3-amps, without meters	125.00	
4026-JM	Reg. Power Supply, 3-amps, with meters	145.00	
4027-J	Reg. Power Supply, 10-amps, without meters	220.00	
4027-JM	Reg. Power Supply, 10-amps, with meters	240.00	
CR2D	Cumulative Recorder, without Event Marker	327.00	
CR2DE	Cumulative Recorder, with Event Marker	352.00	
	Side Event Marker	25.00	
	Replacement Paper per roll	5.50	
	Replacement 2 oz. Bottle of Ink	1.25	
	Filling Syringe	.85	
	Pen Cleaner	.75	
	Ink Starter Suction Bulb	1.25	
	Special Speed Conversion Kit	12.50	
4070-J	Four Channel Event Recorder	238.00	
4070-JM	Non-Standard Chart Speed	265.00	
	Extra Motor	35.00	
	Extra Gear Set	10.00	
	Package of Recording Paper (6 rolls of 60 ft. each)	18.00	
301 G	Interval Timer	320.00	
381-G	Noise Generator	285.00	
761 G	Audio Threshold Relay (Voice Key)	270.00	
382 A	Power Amplifier	135.00	
SS 13	A.C. Isolated Shock Source	285.00	
SS-313	D.C. Constant Current Shock Source	350.00	
SS-313H	High Power D.C. Constant Current Shock Source	450.00	
X-313	Isolated D.C. Constant Current Shock Source	500.00	
X-313H	High Power Isol. D.C. Const. Current Shock Source	600.00	
XA-313	High Speed Isol. D.C. Const. Current Shock Source	550.00	
XA-313H	High Speed High Power Isol. D.C. C.C. Shock Source	650.00	
800-F	Two Channel Tachistoscope	895.00	
	With Precision Intensity Lamp Controls	955.00	
	Extra Copy of "Laboratory Manual in Vision"	3.00	
GB	Three Channel Tachistoscope	2850.00	
GB	Three Channel Auto-Tachistoscope	5400.00	
GB	Six Channel Binocular Tachistoscope	7100.00	
MC4	Multiple-Circuit Mercury Commutator	85.00	
B	Brainprobe Stereotaxic	275.00	
F	Flip Back Stereotaxic	350.00	
Q	Quadruple Stereotaxic	1070.00	
S	Student Stereotaxic	150.00	
SDS	Separate Dissecting Stage	90.00	

Television Equipment on Separate Price List. Reed Relay and Digital Equipment in separate catalogs.

All prices subject to change without notice. Minimum order \$5.00.  
All prices are F.O.B. New York City; terms are net 30 days.



# SCIENTIFIC PROTOTYPE MFG. CORP.



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368-6000

615 W. 131 STREET, NEW YORK, N.Y. 10027

## TV CAMERA AND ACCESSORIES PRICE LIST

### Cameras

	\$
HV-14 -----	400.00
HV-50 -----	395.00
HV-24 -----	1295.00
FP-107-1B -----	1995.00

### Monitors

VM-501A -----	295.00
VM-901 -----	195.00
VM-902A -----	390.00
VM-163 -----	295.00
TU-9UM -----	160.00

### Accessories

Tripod Model TW with Zoom Legs -----	21.50
TV Camera Wall Mount WM-1 Pan-Tilt Head -----	25.00
Extra Coaxial Cable -----	5.00
	plus 10¢ per ft. up to 250 ft.
Other -----	P.U.R.

### Rack Mounting Panel for VM-901 Monitor

Model VM-901-2R (Dual Mount) -----	95.00
Model VM-901-CR (Center Mount) -----	50.00
Model VM-901-LR (Left Mount) -----	50.00
Model VM-901-RR (Right Mount) -----	50.00

### Switches

Model CS-104 (4-position) -----	69.00
Model CS-110 (10-position) -----	129.00

<u>Video Distribution Amplifier</u> Model DA-24 (1:3) -----	189.00
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<u>Automatic Scanner</u> Model AS-101 for HV-14 -----	230.00
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### Vidicon Tubes

Standard and Special Vidicon Tubes for higher sensitivity, altered spectral response, or industrial use, etc.	P.U.R.
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## Lenses

12.5mm fl.4 Wide Angle -----	124.50
12.5mm fl.9 Wide Angle -----	74.50
50mm fl.4 Telephoto -----	99.50
50mm fl.9 Telephoto -----	69.95
75mm fl.4 Telephoto -----	99.50
75mm fl.9 Telephoto -----	59.95
150mm f4.5 Telephoto -----	89.95
Special Ultra-Telephoto, Ultra-Wide Angle, Zoom, and Ultra-High Speed Lenses available -----	P.U.R.

## Video Tape Recorders

SV-700U Black Vinyl Case -----	995.00
SV-700U Walnut Wood Case -----	995.00
SV-800U Console Black Vinyl, w/RF-Video Monitor (37 sq. in.) and with Audio-Video Modulator -----	1295.00

## Special Equipment:

Mixers, line amplifiers, special effects equipment, "Verti-Crawl" automatic card changing displays, and a variety of special purpose units are available.

All prices F.O.B. New York City; terms are net 30.  
All prices subject to change.  
Effective as of August 15th, 1968.



*Electronic Instruments and Precision Components*



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